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WORLD PETROLEUM

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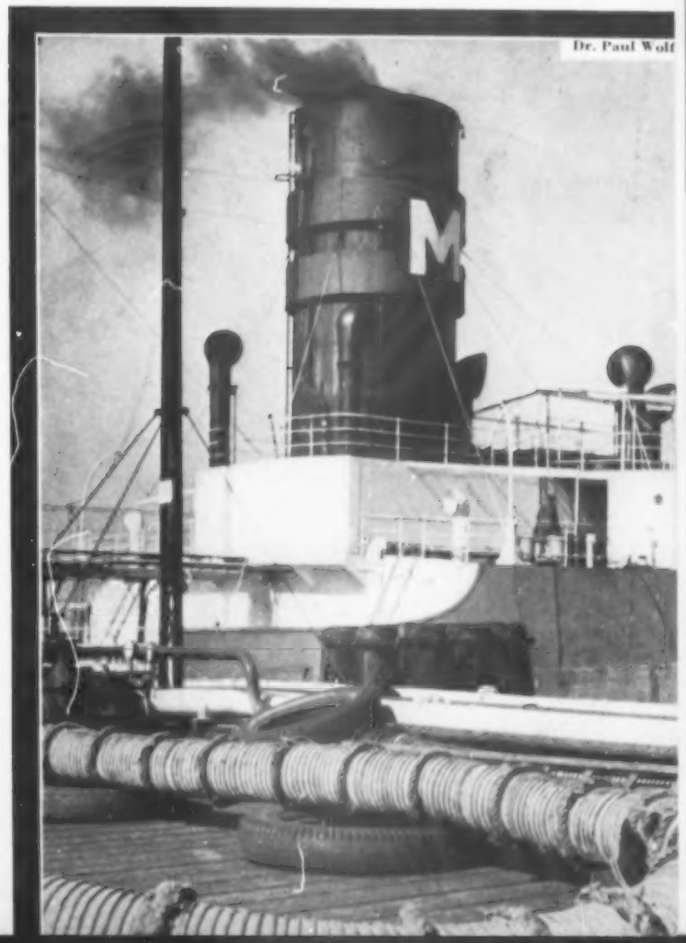
Harold L. Ickes, Petroleum Administrator, Outlines in an Exclusive Article for World Petroleum Progress Made Under the Oil Code and the Problems that Remain to be Solved • Trends in Tanker Construction • Profits from Venezuelan Oil Policy



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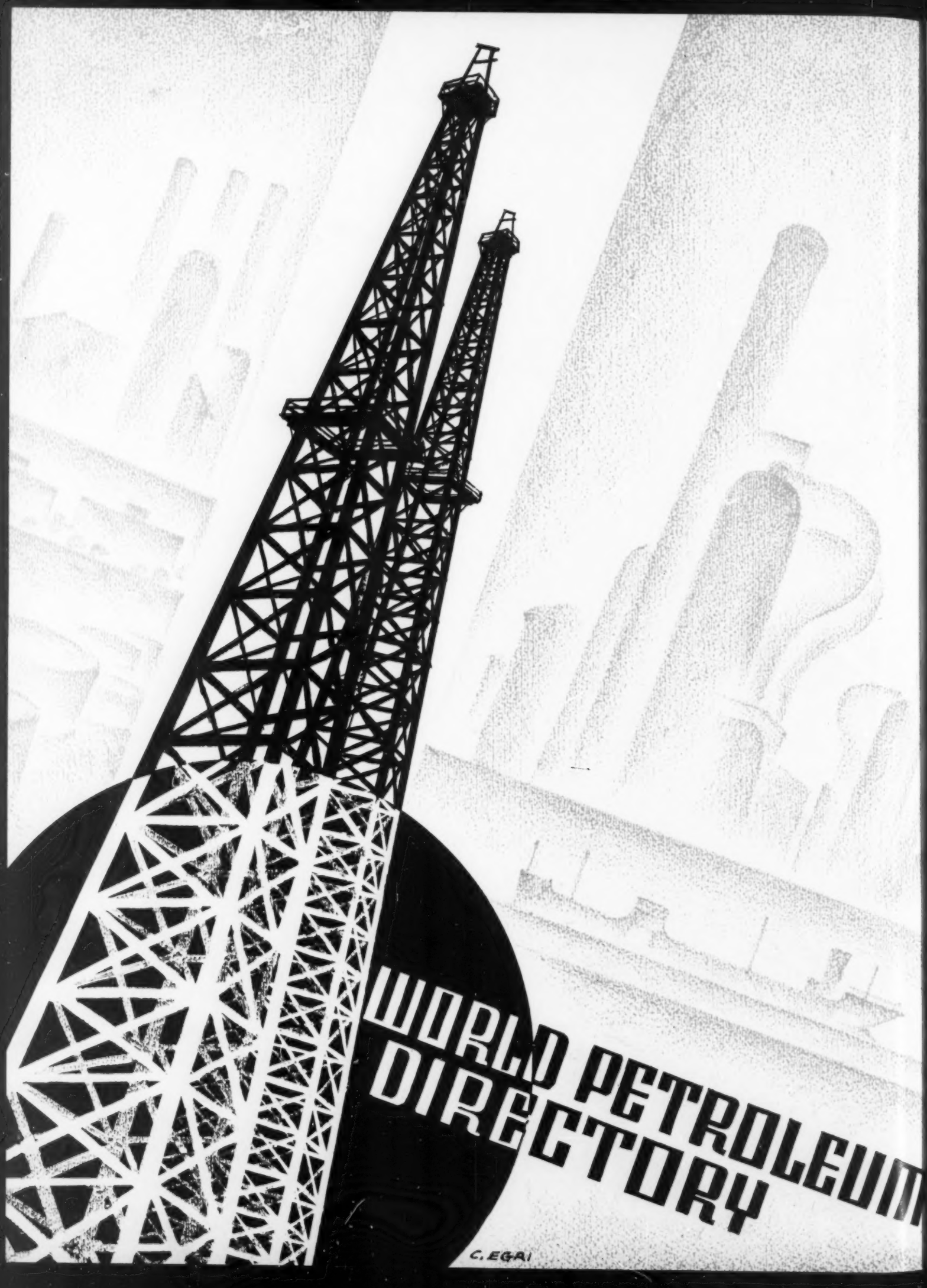
WORLD PETROLEUM
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SEPTEMBER
1934

WORLD PETROLEUM

VOLUME V — Editor, E. W. Mayo — NUMBER 9

CONTENTS

Frontispiece	288
Editorial	289
Foreign Oil Legion	311
Production	312
Prices	317

Special Articles

Progress Under The Oil Code	Harold L. Ickes	290
Tanker Construction Depends on Oil Company Policy	A. C. Hardy	294
Bahrein Becomes International Factor		300
Value of British Product Imports Decreases		302
Venezuela's Petroleum Balance Sheet	Claudio Urrûtia	304
Maintaining 100,000 Miles of Pipeline		306

Published Monthly by

RUSSELL PALMER

56 West 45th Street, New York, U. S. A.

Cable Address, Ruspam, New York and London

Advertising Manager, S. J. Gallay

Executive-Editor, T. Orchard Lisle

▼

CALIFORNIA OFFICE: Bendix B'dg., Los Angeles

London: 3 Savoy Place, Victoria Embankment, W. C. 2

Subscriptions

ANNUAL subscription to WORLD PETROLEUM is offered at the flat rate of five dollars (U. S.) postpaid to any country in the International Postal Union, except in Canada where a special tax compels the publisher to charge $5.60.

For the convenience of subscribers the publisher will accept payment in any of the following currencies at the fixed rate shown below:

Argentina	15 paper dollars
Canada	5.60 do
Colombia	7.25 pesos
France	85 francs
Germany	14 Reichsmark
Great Britain	1 guinea
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Poland	27 zloty
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Russia	1 chervonet
Venezuela	20 Bolivar

Remittances or drafts to the order of the Publisher, WORLD PETROLEUM, payable in New York and London.

Subscriber's name and address should be in Roman capitals on the subscription order.

Official position of subscriber is requested.

Advance notice, if possible, of a change of subscriber's address should be given.

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SINGLE copies of WORLD PETROLEUM are obtainable every month, within the delay imposed by the international mail service, at any of the following agencies:

CABIMAS, VENEZUELA—The German Store
CARACAS, VENEZUELA—Casa Letcher, Torres a Madrices 22
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NEW YORK—Telephone VAnderbilt 3-1095 for list of 20 newsstands carrying copies
PARIS—Librairie Brentano, 37 Avenue de l'Opéra
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PORT OF SPAIN, TRINIDAD—Davidson & Todd, Ltd., 8 Frederick St.
LOS ANGELES—Lendix Bldg., telephone: Prospect 9191
SAN FRANCISCO—58 Sutton Street

The price of a single copy is 55 cents in Canada, 2 shillings in other countries of the British Commonwealth and the equivalent of 50 cents (U. S.) elsewhere.

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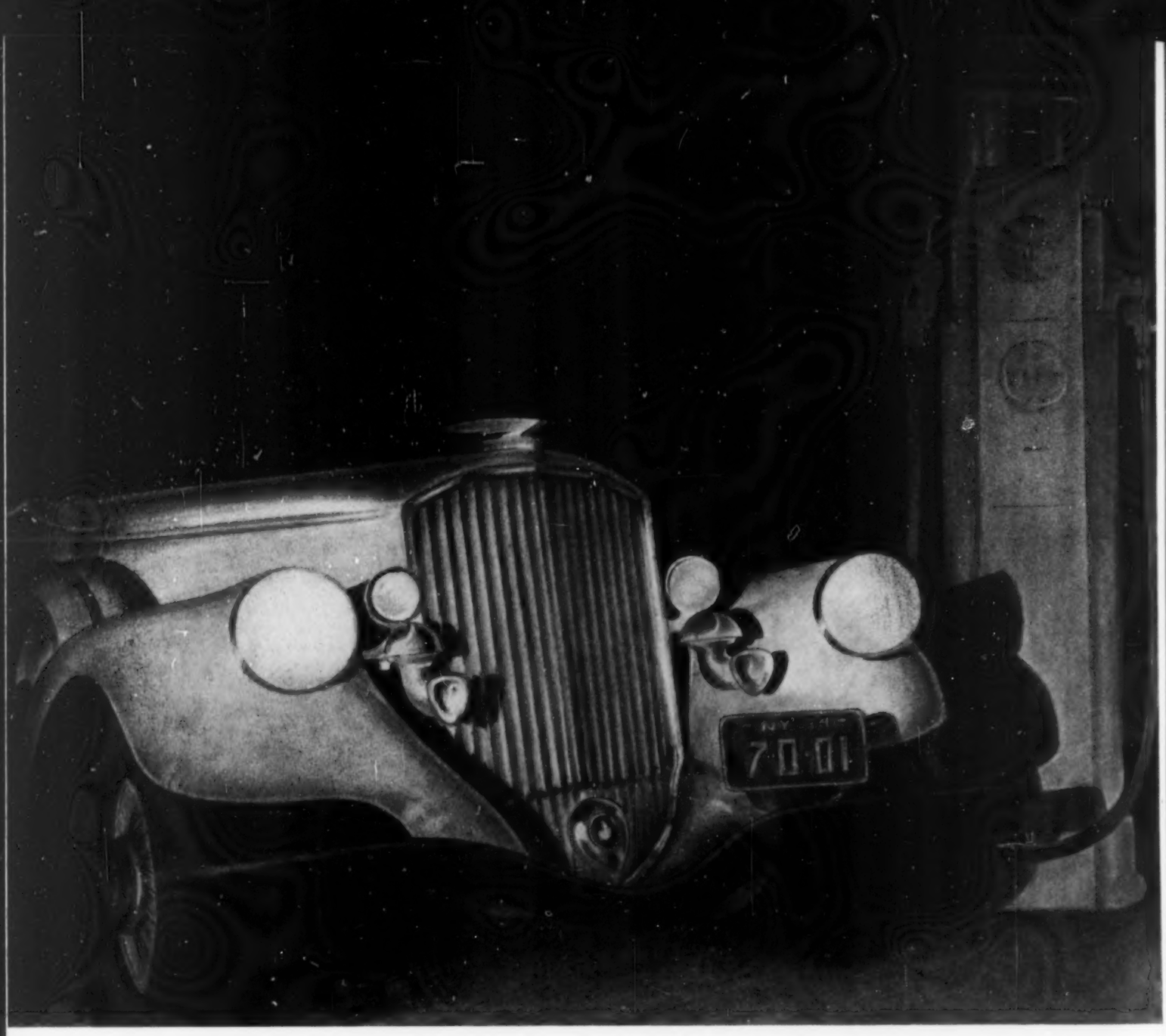

Charles Egri

GASOLINE reaches the end of a long trail that may have begun 8,000 ft. underground 3,000 miles or more distant — a trail which has led through pipelines, refineries and bulk terminals.

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PETROLEUM

CELEBRATION of the seventy-fifth anniversary of the completion of America's first oil well on August 27 has served in a special way to call attention to the revolution in industry, in transportation, and in daily life itself, for which petroleum has been responsible. Oil has served to increase the number of hours out of each day which can be devoted to work, study or recreation. It has lightened the worker's task in a multitude of ways. It has cut the barriers of space to a fraction of their former dimensions and has given man command of the air, a domination long dreamed of but impossible of attainment until the modern motor was perfected.

Oil's 75th Anniversary

In seventy-five years the oil industry has spread around the world and has taken rank as one of the most important and significant of human occupations. In the United States it ranks as the industry second in importance in capital investment. It has created a few large fortunes while uncounted millions have been lost in unsuccessful efforts to develop new production. Today it is inextricably woven into the fabric of modern life, gives employment to millions of men, requires vast quantities of specialized machinery and equipment, and turns out hundreds of useful products to serve specialized needs.

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AT THE beginning of September the oil industry of the United States has completed one year of operation under the provisions of the Petroleum Code established by authority of the National Industrial Recovery Act. The progress made during this year in the direction of a better stabilized and more orderly industry as well as the shortcomings of existing regulation and the problems still to be solved are frankly discussed in other pages of this issue in an article written especially for WORLD PETROLEUM by Secretary of the Interior and Oil Administrator Ickes.

Oil Code's Administration

Perusal of this article suggests that the petroleum industry has been exceptionally fortunate in having Secretary Ickes at the head of the oil administration. In all his relations with members of the industry and in dealing with the maze of conflicting opinions prevailing among oil men themselves on matters of practice and policy the Administrator has exercised painstaking care to get down to the fundamentals of the problems successively presented. There has been no assumption of arbitrary authority, no disposition to "crack down" on those whose opinions might honestly differ from his own.

The same tolerant but determined spirit that has governed the Secretary's administration of the petroleum code appears in his review of this administration. He does not claim that the millennium has been established in the oil industry but deals frankly with its less successful aspects and the problems still to be solved. He recognizes that the refining branch of the industry has not profited by the changes of the past year to the same extent as the producing end and acknowledges that the oil companies are expending $100,000,000 (this probably is a very conservative figure) in carrying out the plans of the government authorities for increasing employment and raising wages.

The showing which the Oil Administrator makes in his article is a favorable one and records some solid achievements for the good of the industry and of the country. Whatever may be one's feeling on the subject of governmental regulation and control there can hardly be two opinions as to the fairness and ability with which Secretary Ickes has discharged the difficult task laid upon his shoulders.

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FOLLOWING a suggestion advanced by *Petroleum World* the directors of the California Oil and Gas Association have invited the American Petroleum Institute to hold the 1935 session of its annual convention in Los Angeles. The proposal has much to recommend it. Although California is one of the three most important oil producing states in the Union it has not been the scene of the Institute Congress since 1926. Of the four most recent meetings two have been held in Chicago and two in Texas.

California's Invitation

Not only because of the volume of its production but also because its oil industry has highly efficient methods and equipment California holds keen interest for every oil man wherever he may be located. Los Angeles has the convention habit and is well equipped to entertain a trade gathering of any size. In the autumn months it is an attractive objective for a trip from any part of the world. With the swift train and airplane service now available across the continent the addition of a thousand miles or more to the journey's length is a matter of relatively slight concern. From every angle therefore it seems that the A.P.I. might very well give consideration to the proposal for holding its 1935 congress on the Pacific Coast.

One Year of Operation Under the Code

Progress Made in Coordination of Production with Market Demand—Decrease in Price Wars—Substantial Rise in Wages and Employment—Problems Remaining for Solution.

By Harold L. Ickes

Secretary of the Interior and Administrator of the Petroleum Industry

Secretary Harold L. Ickes

AT THE INVITATION of the editors Oil Administrator Ickes has written for WORLD PETROLEUM the accompanying article. In it he reviews the progress made toward the stabilization of the oil industry of the United States and toward the establishment of a sound policy of conservation under the Petroleum Code during the first year of its operation which expires September 2. He also discusses frankly the problems that remain to be solved. The article is of the greatest importance to all those interested in petroleum not only as reflecting the views of the Oil Administrator but also as indicating just where the industry stands at the commencement of its second year under the Code.

FOR THE first time since the beginning of the petroleum industry in the United States seventy-five years ago, there is promise of true conservation and sound economic stability. The first year under the Petroleum Code ended on September 2, and we begin the second year with the fundamentals of recovery well marshalled, although there remain some serious problems, particularly in the marketing structure, to be solved. These problems, however, should not be incapable of solution with the continued cooperation of the industry and the states. After all, mutuality of interest is a powerful force and when directed toward the restoration of this vital business and the preservation of our sources of supply, it should develop a unified program that will overcome the obstacles to recovery.

It has taken three-quarters of a century to grow from the Drake discovery well at Titusville, Pennsylvania, into a $12,000,000,000 industry. Many bad practices accompanied this growth. In the early days of the industry there was an appalling waste of the energy hidden in crude oil. This was the result of ignorance. An even greater waste and a more costly one for the nation has developed in recent years from the excessive overproduction of crude oil and the consequent loss of gas pressure. The result has been a sharp reduction in the amount of crude that might be recovered from a pool with consequent loss to our national capital. On the dollars and cents side, excessive overproduction has glutted the market and reduced prices far below the actual cost of production. From a conservation standpoint our potential wealth has been dissipated by prematurely tapping sources of supply that would be even more valuable in the future.

Prior to the formulation of the Oil Code there had been numerous efforts by the states, the government and the industry to work out a stabilization program by balancing production with demand, but these were of no avail. The passage of the National Industrial Recovery Act, which prohibited the interstate movement of illegal oil, provided an effective control, and the subsequent operation of the Oil Code, a means for cooperative action.

Our program for balancing supply with consumptive demand, coupled with the orderly development of newly-discovered fields, has steadily improved general conditions in the production end of the industry. The success of the program, however, is jeopardized by a legal attack on its validity in the so-called Amazon and Panama cases. But, with continued victory in the litigation which has now reached the Supreme Court, I anticipate that the coming year will bring success in the elimination of "hot oil" and assure stability in production. We have further bulwarked this program by efforts to keep refinery output and gasoline needs on a comparative level. We have also sought to eliminate marketing practices which directly and indirectly damage all branches of the industry.

We should not delude ourselves into believing that we have solved every problem or realized every aim. We have been successful only in a measure in maintaining stability throughout the summer. The Pacific Coast petroleum agency agreement, the purchase of surplus gasoline from the flush East Texas field, conditioned on continued code compliance, and other expedients are being used. The recent revision of the hot oil regulations and the new tax regulations provide additional facilities. We are making an effort to maintain improved conditions in the industry, particularly in the production branch where, through the balancing of supply and demand, crude oil prices have been increased from 30 to 50 cent per bbl. levels to 90 cent to $1.00 levels. We are also working to obtain similar improvement for the refiners and distributors.

Weaknesses have appeared in the instrumentalities available under the Code and in the hot oil sections of the National Industrial Recovery Act. To offset them, we urged legislation at the last session of Congress to provide additional authority so that we might use more effective methods. Lack of time prevented adequate consideration of our proposals. I hope that the industry will join the Oil Administration in recommending needed legislation to the new Congress, legislation that will permit a closer relationship between the proration programs of the states, which themselves lack the authority to maintain stability in a neighboring commonwealth. They should be bulwarked by federal law.

Viewing the petroleum program as a whole, however, accomplishments in the

production, marketing and labor fields are noteworthy.

Production

IN ACCORDANCE with the provisions of Article III of the Code, the required crude oil production to balance consumer demand has been established at intervals covering the twelve-months period from September, 1933, to August, 1934. Due account has been taken of probable withdrawals from storage and of anticipated imports, and the required production according to the estimates has been allocated among the producing states. Regulation of production during this period has been sufficiently effective to produce a more equitable distribution of crude production among the several states than had been attained previous to the effective date of the Petroleum Code. So that the domestic producer would not alone carry the whole load of reducing the supply, imports and withdrawals from storage have been restricted by the Code. We consider this procedure entirely justified as a matter of equity.

It is evident from a review of production statistics from the smaller and older producing areas that operations under the Code have enabled the stripper areas to maintain or increase their production and yet receive a field price for their crude which in many states is approximately twice as much as was received about a year ago. There are probably thousands of pumping wells now operating in these areas which were closed a year ago because of the terrific competition from the low cost, high output, flush fields. This improved situation tends to prevent the premature abandonment of oil resources, the scrapping of the invested capital, and at the same time has resulted in the reemployment of many workers in the field and in the supply industries.

Federal allocations for the first six months of 1934 called for an average daily output of 2,381,000 bbl. Statistics of actual production indicate that it averaged 2,480,000 bbl. daily or an excess of 162,000 bbl. daily. Stocks on hand January 1 were estimated at 355,594,000 bbl. and on June 30 at 359,100,000 bbl.

While it is true that crude oil production has exceeded the amount allocated on the basis of federal estimates, it must not be assumed that all of this excess indicates a wilful intent to evade the regulations. We have learned much as the program has advanced. Some of the states found that their methods of proration led to production in excess of the federal allocation. These conditions when noted were corrected as promptly as possible. There have been some departures from the federal allocations, but looking at the situation as a whole, there has been broad support of our endeavor to achieve an equitable balance between crude oil production and the consumer demand for petroleum products. If the validity of the program is upheld by the Supreme Court the government will be able to renew its enforcement efforts, eliminate hot oil and achieve a balance of supply and demand.

One of the problems which confronted the oil administration early and persisted for some time was the lack of correlation between crude oil production and the operation of petroleum refineries. Experience during the early months of operation under the Code indicated definitely that control of crude oil production alone, at least in the transition period from unregulated to balanced production, would not be sufficient. It became evident that the lack of a normal relationship between refinery gasoline prices and field prices for crude petroleum was rendering impossible the profitable operation of petroleum refineries, particularly the non-integrated or semi-integrated refinery which buys all or a major portion of its crude petroleum supply at the posted field prices. As a consequence the Code was formally amended by the almost unanimous consent of the refining group of the industry to provide a joint governmental and industrial organization to determine proper inventories of gasoline for each district and decide upon the production of gasoline in each district necessary to meet the demand.

The regulation of refinery operations thus supplies a secondary method of regulating the flow of crude oil in support of the production program. Operations during June illustrate the possibility of attaining a proper balance between crude petroleum and the manufacture of petroleum products. The estimate of the total motor fuel demand for that month almost exactly equaled the actual demand as later reported, while the actual production of gasoline in each refining district closely approximated the amounts determined as necessary to meet the demand. It was calculated that petroleum refineries should, during June, manufacture 34,600,000 bbl. of gasoline. Production reported to the Bureau of Mines, including some estimates, recorded an actual production of 34,850,000 bbl.

Operations under the Code also have demonstrated the importance of properly planning the orderly development of new oil pools. This, in its implications, is the most far reaching provision in the Code, since it is the beginning of scientific development in accordance with sound engineering practices and economic necessity. As of July 27, there were 357 plans proposed and 254 approved. Plans so far approved provide for an efficient well-spacing program and a reasonable rate of drilling with particular attention directed to providing for the orderly entry of new sources of supply into interstate markets. The industry has worked in close harmony with the oil administration in developing these plans. Experience so far has demonstrated a need for an improved procedure whereby the production from wells on acreage of varying size and situated on advantageous points on the structure may be harmonized.

To meet emergency conditions brought about by the excess production of gasoline in the East Texas area, and to remove the surplus threatening the crude and refinery market structures, we have cooperated in a plan for buying the surplus gasoline by the big distributors. This course is intended to permit the orderly marketing of the surplus so as not to disrupt the entire structure. Virtually all of the refineries in the East Texas field have already entered into contracts for the sale of a portion of their gasoline. The remainder have expressed a willingness to enter into a simple two-party contract with buyers substantially embodying the conditions of the three-party contract which other refiners have signed with buyers and with the Oil Administrator. A form for such contracts has just been approved and agreements are now being negotiated. Both forms of contract have been found by the Department of Justice not to be in conflict with the Anti-Trust Laws. The small refiners in their contracts agree that as a consideration for the purchase of storage stocks and a portion of current production they will not process illegal crude or exceed gasoline allocations. As a result the largest outlet for overproduction in the country is being dried up and a heavy depressive factor in the refinery market is being eliminated. However, that is but the first step toward stabilizing refinery markets. Competitive conditions complicated by excess storage of stocks of gasoline have created a depressed market which threatens the solvency of many refiners. The industry in conjunction with the government must invent some means of bringing prosperity back to refiners which will be successful in reality as well as on paper.

Marketing

WHEN THE Code went into effect, the marketing branch of the industry was in a chaotic condition and prices were at a beggar's level. Thousands of dealers faced extinction. Their stations have been kept open by the Code. We realize

that conditions still are not as orderly as we should like them to be. While it may not appear so to those affected by the ever-present threat of depressed or breaking markets, nevertheless, the marketing branch is in better shape than it was a year ago. Service station prices throughout most of the country are nearer to a normal, fair level than they have been since the East Texas oil field became a dominant factor in the industry. The complexities of the economic evils in marketing practices are many and of long standing. In the past decade, a marketing structure of tremendous proportions has been built up, but without an orderly plan or a sound foundation. When compared with the years of destruction that went before it, our year of rebuilding appears favorably. The full benefit, nevertheless, has not yet been felt.

The industry and the Oil Administration are criticized by some who feel that gasoline prices at retail have increased unreasonably. Figures compiled by the Federal Trade Commission show that the increase on an annual basis approximates but $160,000,000. Retail prices in fifty representative cities throughout the United States in the first six months of 1934 averaged 13.90¢ a gallon as compared with 12.76¢ in 1933, which was the period of the lowest retail prices during the past ten years. The industry has advised us that increased wages and the employment of additional men cost upward of $100,000,000 a year. Accurate estimates are not available but a survey is now being made to obtain correct figures.

In order to rehabilitate the petroleum industry on the Pacific Coast and to do away with the unsound marketing practices which existed in that area, the Pacific Coast Agency was authorized. Because of peculiar competitive conditions in this area, disastrous price wars have raged periodically throughout the territory. The Agency has made it possible for distress supplies to be taken from small refiners, prices have been stabilized and refiners have been assured adequate crude supplies and a fair share of the market, calculated upon their past sales records and their current performances. The Agency Agreement is working toward stabilizing the industry on the West Coast, and especially toward bringing together almost all the divergent interests which, through pressure of overproduction, brought gasoline prices to ruinously low levels. In other parts of the country, devastating price wars that are peculiarly harmful to small independent refiners, jobbers and retailers have been halted, even though sometimes but temporarily. This problem has not been solved, but there are fewer price wars than in the period immediately prior to the Code. Authority recently extended to local committees to deal with local price wars should prove helpful in evolving immediate solutions.

Prior to the adoption of the Code, the practice of loaning or giving equipment, furnishing electric signs, painting filling stations, repairing roadways and many other forms of concessions were common practices. Almost anyone who wanted to go into the filling station business could bargain with the supplying companies and get almost anything that he needed in the way of equipment without cost. This was expensive and was in part responsible for the opening up of uneconomic outlets. The lending of equipment, the paying of taxes for non-company owned filling stations, the loaning of money to filling stations by suppliers and many other similar uneconomic practices have been almost completely discontinued.

We inherited the lease and agency and the lease and license problem from the Federal Trade Commission at the time of the adoption of the Code. Rule 19 imposes certain limitations on the use of these methods of marketing and placed upon the Administrator the duty of resolving the problem. While there are many agreements of this character still in effect, I have been assured that a large number of the companies which formerly used these contracts have practically discontinued the practice. A decision on this problem, satisfactory generally to the industry, was proposed as a corollary of the National Marketing Agreement. As soon as the future of that Agreement has been determined, we shall be in a position to settle the issue of lease and agency and lease and license.

The commercial consumer discount schedule has undoubtedly assisted the attempt to distinguish between the retail and jobber functions in marketing. It is, of course, difficult to determine whether under this schedule minimum deliveries should be 25 gallons, 100 gallons or some other figure. As in most cases of this sort, however, the benefits which result from drawing a line between two extremes far outweigh the hardships developing at the point where the line is drawn. The application of the schedule has tended to discontinue cut-throat competition in the industry and has at the same time assured consumers reasonable discounts. This rule has not been entirely satisfactory to the filling stations, as some of them continue to maintain that it has diverted business from them to the jobbers or other suppliers. The smaller jobbers also have complained because it has not put them in a competitive position with respect to larger consumer business. Both of these problems remain unsolved, but they are being diligently studied. Special steps were taken to provide relief as emergencies developed. An example of this was the exception for Region 6 to the minimum delivery requirement of 100 gallons to permit deliveries of less than that amount on the Pacific Coast for the period of the general strike when the normal flow of supplies was disrupted.

The problem of jobber and dealer margins was not solved by the Code. It is, as it always has been, a very sore point in all sections of the country. Jobbers and dealers who sell motor fuels at prices established by their suppliers are generally of the opinion that they should have a guaranteed margin. Trackside and "dock" operators are in general not the least bit interested in the guaranteed margin. Many independent refiners maintain that they cannot guarantee a margin or, if they guarantee any at all, only on a split basis. While the major companies in general guarantee margins they do not appear to be wholly satisfied with the situation because of the lack of uniformity in marginal contracts. And inherent in the competitive system is the struggle over the spread of margins. The government is studying the problem and is willing to cooperate with the industry in an attempt to work out a satisfactory solution.

Before the Code, the credit policy of oil companies was in great confusion and the inconsistent operations frequently were discriminatory, especially since many similar organizations were not in a position to offer credit terms as extensive as those available to companies with greater capital assets. The Code to a considerable extent has eliminated the bad effects of indiscriminate and discriminatory credit, generally to the satisfaction of all concerned. While there is a direct relationship between regulating production to the limits imposed upon it by demand, the marketing branch of the industry has, to a great extent, suffered from the pressure of motor fuel produced without any regard to the sales position of the refining company. Furthermore, the refining companies have been lured into some sort of belief in the magic of innumerable outlets. The increase of outlets has gone on in all parts of the country. A decline in gasoline consumption, coupled with the increase in outlets, has made for smaller and smaller gallonage passing through the average station. While in times of distress we should attempt to maintain employment, it should be remembered also that the consumer ultimately has to pay for the expensive marketing system developed by the greed for gallonage. A method of correcting this situation is not

provided in the Code, but I commend to the industry a study of this problem.

Labor

SPECIAL attention should be paid to the labor provisions of the Code. The standards for labor set up in the Petroleum Code are among the highest in any of the codes that have been adopted. Thirty-six hours a week is the standard in oil production, the operation of pipelines and refineries, and forty hours in clerical work and wholesale marketing. In retail marketing, the work week for gasoline service stations is set at forty-eight hours. In these stations eighty-four hours a week were common prior to the adoption of the Code, and in the rest of the industry, most employees worked from fifty-four to sixty hours with many having a seventy-two hour week.

The minimum wage rates fixed in the Code for common labor in production, refining and pipeline operations vary from forty-five to fifty-two cents an hour in different regions of the country, and these wage rates are considerably higher than the minimum rates fixed in most of the codes. An equitable adjustment of the differentials between the minimum labor rates and the rates for skilled jobs in the industry has been provided. An order issued in May fixed the minimum rates for skilled workers for a thirty-six hour week at 80 percent of the weekly earnings in 1929 for a week of from forty-eight to fifty-six hours. It made proportionate adjustments for others in an attempt to give to all skilled workers approximately the same *real* earnings that they had in 1929 for a much longer week on a basis of the price level as of the winter of 1934.

The effect of the reduced hours, of course, was to require the employment of additional labor in the industry. Just how many workers have been added to payrolls since the Code went into effect it is impossible to tell with any accuracy at this time. But a survey of the effect of the Code on employment and wages has been begun by the Bureau of Labor Statistics of the Department of Labor in cooperation with the industry and the Petroleum Administration, which will give accurately measured results.

Meanwhile, although there is uncertainty as to the exact amount of additional employment and purchasing power resulting from the adoption of the Code, there is no question but that the Code has added greatly to the number of employees working in the industry as a whole. Nor is there any doubt of the increase in purchasing power of the wage-earners brought about by the minimum wage rates fixed in the Code for common labor and by the wage differentials for skilled labor. Equally important has been the freedom which the Code and the NIRA have established for wage-earners to organize as they may see fit and to bargain collectively through representatives of their own choosing. Whatever one may think of the merits of company unionism and independent trade unionism, no one who is informed on labor relations doubts that wage-earners fare best under collective bargaining in selling their labor at fair prices and in protecting their interests and standards of living. Prior to the establishment of the Code there was very little collective bargaining in the industry. Since the Code went into effect collective bargaining as a method of fixing terms and conditions of employment has spread widely through the industry in all parts of the country.

The petroleum industry has been fortunate in having most of the questions of representation and organization for collective bargaining settled without strikes. One of the first labor disputes referred to the Petroleum Labor Policy Board involved questions of representation, and a decision was made, approved by me (Case No. 2, Magnolia Petroleum Co.), which explained the rights of the employees under Section 7a of the NIRA and laid down rules for the orderly determination of the free choice of employees by secret ballot elections. Most of the oil companies accepted this decision and have been cooperating with the Labor Policy Board in holding elections or checking payrolls whenever a question arises as to who are the duly accredited representatives of the employees.

Since February, the Board has handled thirty-five cases of this kind and has issued certifications indicating the free choices of the employees in each case. With one or two exceptions the companies have accepted the certifications issued by the Labor Policy Board and have entered into collective bargaining arrangements satisfactory to employers and employees.

Where strikes threatened or were begun, the Labor Policy Board acted as a mediating and conciliating agency, and usually succeeded in securing a satisfactory adjustment between the parties. The Labor Sub-committee of the Planning and Coordination Committee has helped the Board in making such adjustments. It has spread information among the members of the industry as to the proper handling of disputes under the Code. In this manner orderly and stable labor relations are being promoted in the industry at a time when there is widespread industrial unrest throughout the country.

Numerous complaints of violations of Code provisions affecting labor have been made to the Petroleum Administration, and the prompt and effective handling of these presents a serious problem, both to us and to the Planning and Coordination Committee. At first the Committee tried to investigate and secure compliance through its local Code committees. This was not particularly satisfactory because in many instances the employer against whom the complaint was made was a member of the committee. Then the Division of Investigations of the Department of the Interior undertook to handle most of the complaints. The agents of this Division are enforcement officers and are not authorized to make adjustments as between employers and employees. Many of the complaints are of a character that require adjustments and conciliation between the parties. We are concerned with the method by which such adjustments and conciliation can be accomplished and seek advice from the industry. The problem of securing general compliance with the labor provisions of the Code is a very serious one for an industry that operates in every state in the union. A method will have to be developed by which complaints and adjustments can be made locally without bringing them to Washington. The problem is far from being solved, but substantial progress is being made. The Labor Policy Board has functioned continuously in an advisory capacity. As a compliance authority the Board has handled approximately 1,600 requests for information, has adjusted approximately 700 complaints, and has about 800 complaints pending.

Litigation and Enforcement

WE ARE criticized in some quarters on the ground that we do not prosecute violators. It has been necessary in the past year to proceed slowly because of the newness of the recovery legislation under which we are operating and the constitutional questions involved. It appeared to us that carefully selected cases were advisable to build up a favorable and substantial body of precedents on the issues. Now that we have built the foundation, we will act more swiftly. Prosecutions will be handled through the Department of Justice by the United States District Attorneys throughout the country under a cooperative arrangement between the Departments of Justices and of the Interior, entered into to expedite action. Several thousand complaints have been investigated by the Division of Investigations. Where the evidence indicates that action should be brought, we recommend prosecution to the Department of Justice.

(Continued on page 317)

An 8,000 ton tanker at the dock of Sinclair Petroleum Company S/A plant at Doornzele-Bogatelle on the Ghent Canal.

Oil Company Policy to Determine Future Course of Tanker Construction

Building or Chartering Remains the Unanswered Question—Majority of Existing Vessels Approaching Obsolescence but Tonnage is in Excess of Present Requirements.

By A. C. Hardy, B.Sc., A.M. Inst. N.A.

International Marine Writer and Commentator

INTERESTING questions in relation to the present tanker situation are: the effect of the Shierwater plan on freight rates, the construction plans of the big oil groups—as to whether building or chartering will prove eventually to be the ruling policy—and the effect of these two factors upon the building of tramp tonnage.

It must be admitted on the one hand that a large proportion of the world's tanker fleet is obsolescent. This is one of the principal justifications for building at the present moment. It is equally true on the other hand that there is a surplus of tonnage for present requirements, that freight rates are low and there is little likelihood of an early advance.

The most modern motor driven tanker is fast and uses but little fuel. She can do roughly about 1½ times the amount of work per year that her old steam driven sister did. Her fuel consumption is so small and her conditions of operation so economical that she can make money at freight rates so low that other older ships lose money on the equivalent figures. This alone is a factor tending to hold the rates down in spite of the Pool's plan to keep them up.

If marine engineering and naval architectural technique are to be allowed to develop naturally there is no doubt that the world's tanker fleets of the future will be smaller than in the past, if only because the average speed has increased and fewer efficient ships will do the work of a larger number of slow units. It is not likely that in the near future the high speeds (17–18 knots) of some of the Japanese naval tankers will be generally emulated, but the speed and power is there in minimum space if it is needed with the modern Diesel, for it is this type of propulsion which is playing the major part in tanker construction at the moment for many obvious reasons. The possibility, however, of high pressure steam installations with water tube boilers and geared turbines is not to be neglected in cases where plenty of boiler oil is available for cheap burning.

According to Table I, which lists 58 tankers ordered throughout the world since October 1933 there are only two such ships now building and these are being constructed for the Socony Vacuum Oil Company at the New York Shipbuilding Company's yard at Camden, N. J. These are ships of 18,600 total gross tonnage and contribute very materially to the total of six steam-driven tankers with a total of 37,424 gross tons building in world shipyards at the end of the June quarter, the last date for which the Lloyd's Regis-

ter shipbuilding returns are available. The total for motor-driven tankers shown in these returns (Table II) is 33 with a gross tonnage of 240,420 tons, which shows the big preponderance of Diesel power. Of this total, British shipyards contribute the largest amount with eleven motor vessels with 86,900 gross tons of which eleven are accounted for by the replacement program of the Eagle Oil & Shipping Co. and the Anglo-Saxon Petroleum Co., now in hand.

Next in individual numbers as well as in tonnage is Denmark with five motorships of 34,950 gross tons building, four of which are at the Odense Steel Shipyard of A. P. Moller where one 12,750 tonner (dwc) is for his own account, two 14,250 tonners are for a Norwegian owner and one is for the Anglo-Saxon Petroleum Co., the first placed by the latter concern in Denmark for some time. Burmeister & Wain are building one tanker listed by Lloyds and another laid down since the statistics were published. Both of these are to Norwegian account.

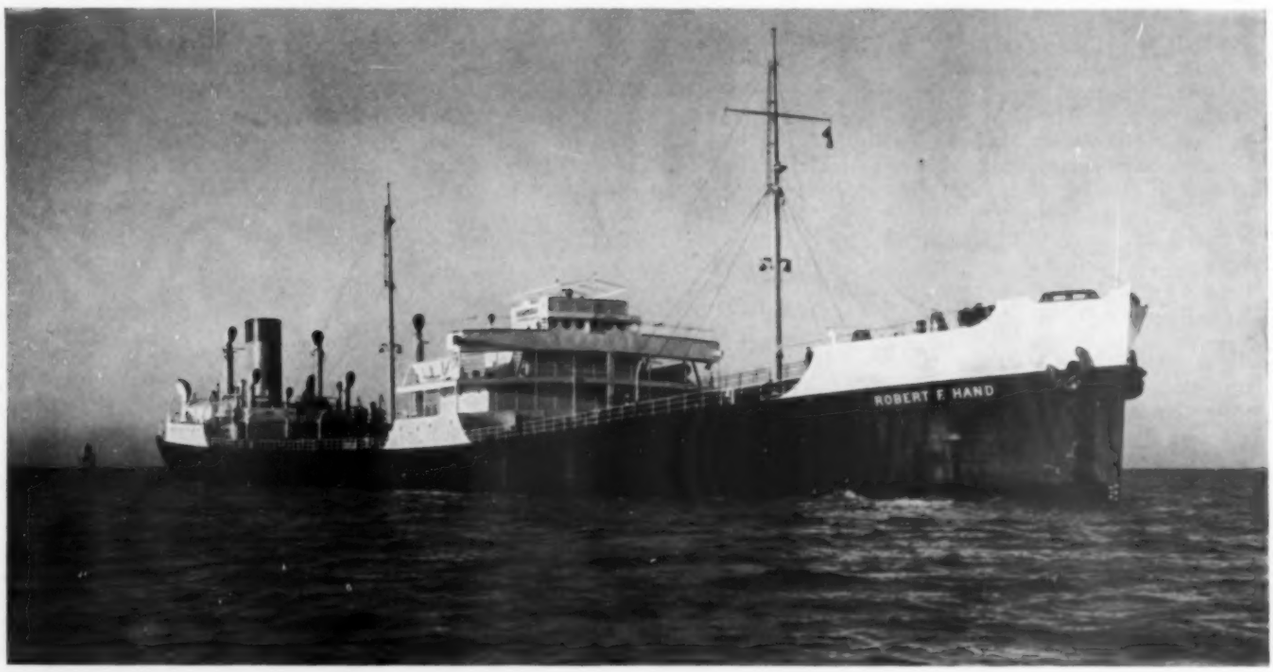
Germany comes next with three motor tankers; two of 12,100 tons each are Anglo-Saxon units while the third is one of the two large units with Krupp engines of 15,000 tons each designed for the Standard-Vacuum Transport Co. Holland has two small ships for the Anglo-Saxon Petroleum Company's Caribbean-Maracaibo services, propelled by an interesting combination of reciprocating engines and water tube boilers with superheat. The former are being used presumably because of their suitability for domestic work in Lake Maracaibo and the latter because of lightness and compactness. Only one of these is listed in Lloyd's Returns since the second presumably was not laid down when the returns for the statistics were made. Three larger vessels are listed with a total of 23,570 tons gross, two of which are Anglo-Saxon ships of the 12-unit program, contracts for which were placed towards the end of last year. The third ship mentioned is one of the two which the Standard-Vacuum Transportation Company plans to use in developing Far Eastern trade with the products of the Palembang refinery.

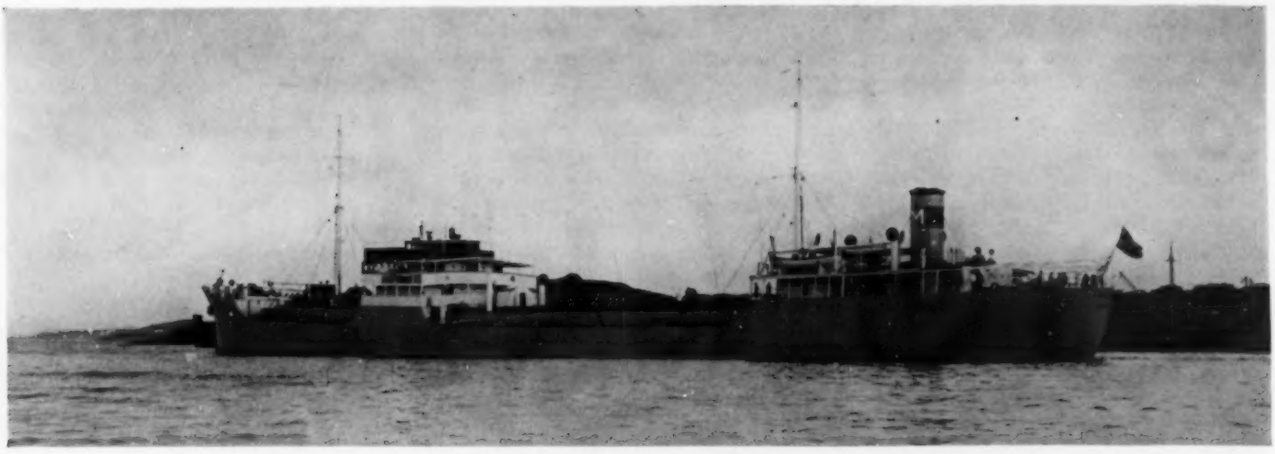
The Dutch tanker construction situation is worth watching, particularly in so far as contracts are given to the yards from companies outside the Anglo-Saxon group. Even at the height of the tramp tanker building boom Holland, perhaps fortunately for herself as events have turned out, was not a large contributor to the credit tanker building business, the few ships she built for Norwegian owners having been constructed long before the bottom fell out of the market. The other tramp tankers constructed in Dutch yards have been mainly for account of her own owners. This is proved by the fact that Holland contributes to the International Tanker Pool only eight ships, of which seven are fairly modern motor vessels all under the control of one owner—the Van Ommeren concern. The charter situation is well delineated, in passing we may say, by the fact that Norway's contribution to the pool comprises no less than 136 ships of which almost all are internationally built mortgage tankers which can make reasonable profits and pay off mortgages at a freight rate of about 10/–, and above, i.e. at a figure which may require some ingenuity on the part of the pool to maintain. The new Norwegian ships now building are also entered in the pool—10 in all.

Italy is now building two tankers, one of which is a unit of the Anglo-Saxon program and the other a charter tanker. Both are motorships. Japan's two units are fast 19-knotters similar to the TEIYO MARU illustrated herewith. The possibility of their naval use is something which cannot be overlooked because of their power and general arrangement.

For the rest the tankers under construction (Table II) include two units in Spain of small size, one steam and one Diesel, and three larger vessels in Sweden. Of these three, two are building at Gotaverken and one at Eriksberg (illustrated), for Norwegian owners. There is also another ship, not listed, for the North Star Line, Stockholm, of coastwise type. Its completion may curtail the activities of the Royal Swedish Navy tanker BRANNAREN which recently caused a sensation through the action of the Navy Ministry in sanctioning its availability for general charter-

The 18,025 ton, Anglo-America Oil Company's tanker Robert F. Hand carrying 140,000 bbl. at 12½ knots.





Diesel tanker "Maridal" designed by Eriksberg for A/s Moltzaus Tankrederi, Oslo: 9,800 d.w. tons.

ing. This completes the grand total of 39 tankers of 1000 tons and up under construction as at June 30 with a gross total of 277,844 tons.

The key to the whole situation may be said to lie with the future policy of the big oil companies, particularly the Anglo-Saxon Petroleum Company, as regards new construction. Is their 12-ship and the Eagle Oil Company's 6-ship program the spearhead of a constructional program extending over many years at so many ships per year, or is it at the moment nothing more nor less than a mere replacement of old tonnage? How is the construction of new tonnage which because of its modernity can operate at reduced freight rates to be reconciled with the big companies' participation in the Shierwater plan, whose *raison d'être* is to keep freights up to an "economic" level, whatever that may mean?

It has been calculated, for example, that a modern tanker with every attention paid to hull form and to steam conditions can make money for its owners in Curacoa-U. K. trade at a freight rate of between 5/6 and 6/– allowing for interest, amortization, insurance and all running expenses on a liberal scale providing comforts for crew. The tanker pool freights are, however, apparently to be maintained at between 8/6 and 9/6. Examination of freight rates shows that maximum building of tramp tonnage took place when rates were high as during the years 1924–27. For example, California-U. K./Continent rates in February of 1927 for clean tankers touched 64 shillings and the Russian Black Sea-U. K. figure stood at 41 shillings and sixpence. The rates are now less than 13 shillings and seven shillings respectively at which figures it is contended the really modern tanker can make money. This is a point which must not be overlooked in any consideration of plans for boosting freight rates in an artificial way.

As regards other trades, average rates for clean tankers fixed for Gulf-U. K./Continent with loading up to two months after fixture touched a high figure of 52 shillings and sixpence in January 1924, approached only again in November 1926 at 50 shillings and again in May of 1927 with the same rate. Before the end of that year the figure had dropped down to 16 shillings and sixpence, to drop again even lower to 12 shillings in November 1928 and to soar to 50 shillings in February of 1930. The drop in that year again was phenomenal to nine shillings and sixpence after which it stood at nine shillings for nearly two years. Fluctuations between nine shillings and eight characterised 1933 and the rate is now fairly steady around that figure. The mortgage built charter type ship could obviously make money at the high rates and even at what would be called reasonable rates, but will these return?

There is not the slightest evidence under present conditions that rates will return to the levels of ten years ago. They must therefore either be "maintained" at a level or allowed to be governed by prevailing natural demands or the figure which the most economical ship on the market dictates. With the ocean rates at the moment, then, at about nine shillings and sixpence, as mentioned above, and the ability of modern ships to operate—on paper at any rate—at five shillings and sixpence the charter situation is not too happy, yet the narrow margins on which such matters are arranged is shown by the computation which many tanker authorities support that at a 12/6 freight rate Curacoa-U. K. tramp tankers of reasonably modern type can make about 52.7 percent interest on capital.

We may assume, neglecting for the moment the state of the world's tanker fleet as regards obsolescence—and some authorities assert that something like 65 percent of all existing ocean tanker tonnage, excluding coasting vessels is obsolete—that the pool is well stocked. Its constituent units are mainly Scandinavian. Any increase in nationalism culminating in the desire of each nation to carry its own oil in its own bottoms would upset matters completely and is a question which undoubtedly is being watched very closely by the big oil companies whose policy it has always been to build their own tonnage and to place it under the flag of the country in which it is built. The worst situation that could arise from a pool point of view would be an extension of the government monopoly schemes which have helped shipbuilding in Spain with the construction of the Campsa fleet. Spread of government monopoly does not seem likely at the moment but its possibilities cannot be overlooked.

A study of the list of charter tankers reveals at once the tremendous preponderance of Diesel engined tramp tankers in general and of Norwegian ships of this type in particular, and a glance at the names shows very clearly the amount of work which has been done by shipyards in Europe in the last few years to bring international tramp tanker shipping to its present position, where there is so much surplus tonnage available. Of all the units of the countries mentioned, there is a grand total of 334 tankers shown in the pool. Of these 199 are Diesel driven ships and 135 are steamers. To be added to this list in the near future, unless they have long term charters available, which appears rather doubtful, there is a total of 13 ships, 10 of which are motor vessels

built for Norwegian owners, two are steamers for British owners and one is a motor vessel for Italian owners. The proportion of Diesel to steam in the various known trades is interesting and the fact that of the 136 units which Norway contributes to the Shierwater Plan, 110 are Diesel engined while only 26 are steamers, is an ample indication of the lavishness with which Norwegian owners have contracted for the construction of tramp tankers on the deferred payment system within the last few years.

This list of 136 steam and Diesel tankers total, is not a complete list of Norway's tanker fleet because it includes only the more or less fluid tonnage which is still available for long and short term charter and takes no account of those fortunate vessels built during the past ten years which are still employed on long term charter work, either to the Anglo-Saxon or to some of the big American oil companies. It speaks well for the optimism with which the Norwegian tanker owner regards the future that ten ships of tramp type should still be on the stocks.

As far as Great Britain is concerned there are 94 vessels included in the Shierwater Plan and the division between steam and Diesel is here, curiously enough, quite equal, there being 47 of each type. The British ships include a total of 19 ships of between 8,000 and 11,000 tons owned by British Molasses, Ltd. which, of course, is one of the principal moving spirits in the Shierwater Plan. The remaining units of the British group of motor vessels is made up of five units owned by Tankers Ltd., some Andrew Weir ships and some vessels owned by Huntings of Newcastle. British Molasses Ltd. contributes only one unit in the steamers and the vessels generally in the same group are of old type. Even Great Britain which still remains, as far as possible, the home of steam propulsion, has lately turned to Diesels for tramp tanker tonnage.

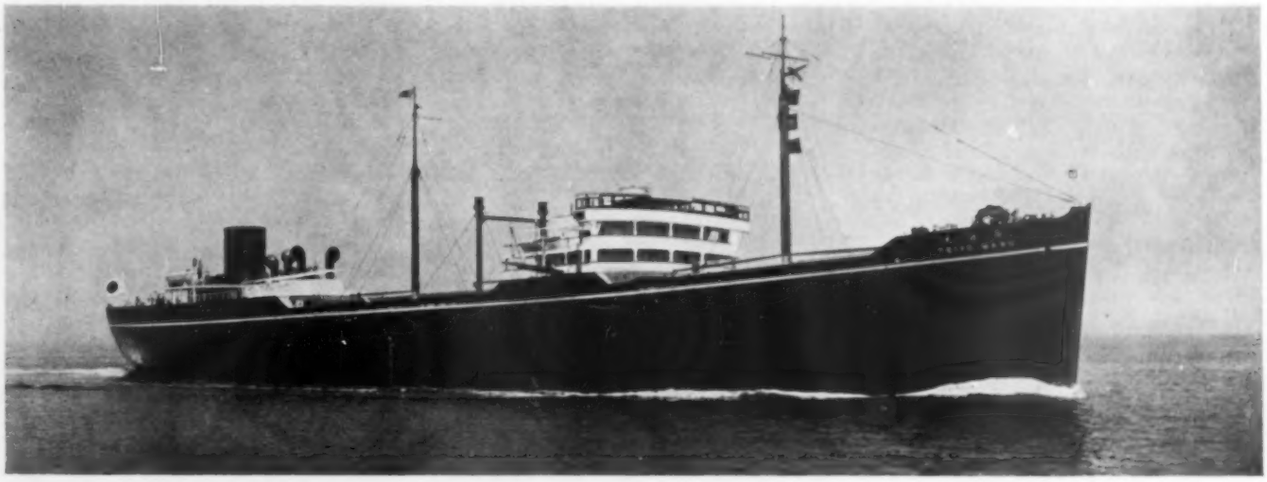
Italy's contribution to the tanker pool comprises 47 units, only seven of which are Diesel driven, while the remaining 40 are old steamers. There is also one Diesel engined vessel building. The Italians are not, however, habitual charterers of tanker tonnage and an analysis of the situation shows that the Scandinavian countries are by far in the lead in this connection. In the initial list issued by the International Tanker Owners' Association, France comes next with 14 contributions to the tanker pool, only three of which are Diesel. In this connection, it is worth calling attention to the fact that the French oil tanker fleet was discussed in the fuel oil trade column of LLOYD'S LIST recently in connection with Sir Robert Cahill's report on France in which it was stated that although the French oil fleet in 1914 comprised only four vessels and in 1920 had a tonnage of under 3,000 tons, at the end of 1933 this tonnage exceeded 400,000 tons.

Sweden comes next on the list we are considering with 10 vessels—all motorships, most of which were constructed in Gothenburg shipyards during the past few years, although there are one or two of German construction. Germany has 17 entrants to the pool, nine of which are steamers and eight Diesels, these latter being mostly of medium sized type. Germany, in fact, does not figure in the tanker chartering scheme with vessels of large size, neither for that matter, does Denmark which contributes only seven units—all motor vessels—and the list does not include some of the largest Danish units which are on long term charters to Standard Oil subsidiaries or which are operated by oil companies themselves.

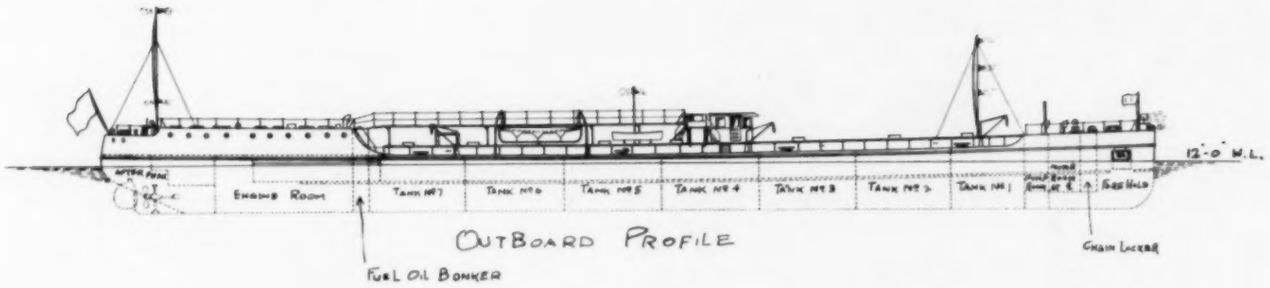
Holland shows a total of only eight charter tankers, of which only one is a steamer and all seven are owned by the Van Ommeren Company, while surprisingly enough, the last vessel on the list is a Turkish steamer—the ANTARES of 3,723 tons gross.

It will thus be seen from this analysis that not only are motor vessels in the ascendancy but that one country has easily an enormous preponderance of this type of tonnage. This is Norway with no less than 110 units, the building of which was spread between Great Britain, Denmark and Sweden. It is this group of ships which has been the subject of tanker pool legislation before and which in general represents an up-to-date method of oil transportation. This tonnage which was built essentially with a view to capturing anything which might be given in the way of charters and built as it was, is naturally the first to suffer either from a depression or from a drop in freight rates or from a change in policy on the part of the oil companies which would envisage the construction of large numbers of ships for their own use.

From a carrying point of view, the size of these Norwegian motor units varies from 12,000 tons to 15,000 tons. They are mostly twin screw vessels and are propelled by 4-cycle, single-acting air injection oil engines, having a speed in service of between 10½ and 11 knots. The majority of them are based on designs which were perfected up to six or seven years ago. How will they meet the competition, we may well ask, of the newer ships now constructed whose initial design stages occurred perhaps eighteen months ago? Here the tendency has been to increase



Teiyo Maru, world's fastest tanker built for Japan on advanced tanker design.



Outboard profile plan of the Socony-Vacuum tanker "Poughkeepsie-Socony" whose all-welded construction marks a new step in tanker building.

speed and to decrease fuel consumption coupled with a policy of keeping the size within moderate limits so that the ships have a wide range of ports to and from which they can trade. One typical ship in this group has dimensions 381.3 ft. x 55.2 ft. x 30.3 ft. She was completed in June 1927 and has a speed of about 11 knots on just over 10 tons of fuel per day with a total of 2,700 h.p. on twin screws with 6-cylinder, 4-cycle airless injection Diesels 21.62 ins. diameter and 39.37 ins. stroke. Her auxiliaries are part steam and part electric. This is the type of tonnage which has been offered on the world's markets lately and which, it is claimed, really modern design can undercut to the amount of two or three shillings in the freight rate and still make a reasonable profit for the owners.

The problem of obsolescence is one that is giving some concern to American operators and particularly to U. S. naval authorities in view of the importance of

Table I—Sea and Ocean-Going Tankers—Odered From October 1933 to date

Owner	No. of vessels ordered	D.W.C.	S.H.P.	Builders
Eagle Oil Co.	6	11,200	3,500	Furness Sb. Co. Swan Hunters Blythswood Lithgows Hawthorn Leslie Harland & Wolff
Anglo-Saxon Co., London	12	12,100	3,500	Swan Hunter Bremer Vulkan Rotterdam D.D. Netherland Sb. Co. Odense Cant. Riuniti dell'Ad. Deutsche Werft Harland X Wolff Workman Clark Lithgows Wilton-Fijenoord Howaldtswerke
Anglo-Saxon Co., London	2*	3,390	2,500	Netherland Sb. Co., Amsterdam
Cia. Transp. de Petroleos, Buenos Aires	1*	5,350	1,950	Furness Sb. Co. M'boro
Argentine Govt., Buenos Aires	1*	10,000	4,200	Deutsche Werft
Standard Vac. Trans. Co.	2	15,000	3,600	Rotterdam D.D. Fried Krupp
Socony Vacuum	2*	15,050	4,000	New York Sb. Corp.
Socony Vacuum	3	16,000 bbl.	700	United Dry Docks, N. Y.
A. S. Havprins, Oslo	1	12,500	3,450	Kockums M. V.
Sigval Bergesen	2	14,250	3,700	I. Odense Steel Shipyard
Jorgen P. Jensen, Arendal	1	14,000	3,720	Burmeister & Wain
J. L. Mowinckels Rederi, Bergen	1	12,000	3,450	Gotaverken
Rederi A/B Freikoll, Oslo	1	12,000	3,450	Gotaverken
Arcadia Sa. Co., Oslo	1	12,500	3,450	Eriksbergs
North Star Line, Stockholm	1	500	400	Oresund Sb. Co., Landskrona
S. H. Smith Sorensen, Arendal	1	12,500	3,450	Kockums M. V.
A/S Dovrefjell, Oslo	1	12,500	3,450	Kockums M. V.
A. P. Moller, Copenhagen (now foreign owners)	1	12,750	3,150	Odense Steel Shipyard
Ostlandske Pet. Co.	1	9,900	2,600	Akers M. V.
Ultramar Soc. Petrolera, Buenos Aires	1	2,150	950	Nakskov S. V.
Martin Mosvold, Farsund	1	14,500	5,000	Burmeister & Wain
Cia. Aux. de Nav., Paris	1	18,500	6,500	At. & Chant. de La Seine le Trait
Rederi Tonnevold A/S, Grinstad	1	15,300	3,800	Gotaverken
Soviet Republic	5	7,600	2,600	Sormovo Works
Iino Shoji Kaisha	2	——	7,600	Kawasaki Dockyard
Gulf Refining Co.	1	15,400 bbl.	850	Bethlehem Sb. Co.
D/S A/S Skien, Skien	1	100	70	K. Christensen, Moen.
Texas Co. (Norway) Ltd.	1	12,400	3,200	Nakskov S. V.
Julius Schindler, Hamburg	1	2,000	900	Werft Nobiskrug, Rendsburg
Stettiner Oel-Kontor G.m.b.H., Berlin	1	275	——	Schiffswerft O. W. Kremer Sohn, Elmshorn
Benzine Transport Co., Stockholm	1	145 cu. m.	140	Finboda Works, Stockholm

* Steam driven tankers: all other vessels in this table are motorships.

fairly fast vessels to supply the needs of the fleet. A recent survey made under naval auspices shows that out of a coastwise tanker fleet of 239 vessels aggregating 1,604,000 tons and U. S. foreign tankers numbering 50 with a gross of 338,000 tons some 88 percent is more than ten years old, the average age being about fifteen years.

Table II—Oil Tankers Under Construction in the World, June 30, 1934

Country of Build	Steam		Motor		Total	
	No.	Tons	No.	Tons	No.	Tons
Gt. Britain & Ireland	2	14,600	11	86,900	13	101,500
Denmark	–	——	5	34,950	5	34,950
Germany	–	——	3	24,900	3	24,900
Holland	1	3,200	3	23,570	4	26,770
Italy	–	——	2	17,900	2	17,900
Japan	–	——	2	19,200	2	19,200
Spain	1	1,024	1	3,500	2	4,524
Sweden	–	——	3	24,700	3	24,700
United States of Am.	2	18,600	3	4,800	5	23,400
Totals	6	37,424	33	240,420	39	277,844

The U. S. Navy Department undoubtedly would like to see modern fast tankers of an efficient type built by the oil companies in American shipyards and is ready to give encouragement to such construction. Its recommendations in this respect have been withheld awaiting the revision of the American merchant marine program. If that program when presently laid down contains no sufficient inducement to encourage private construction the Department probably will propose the building by the government itself of a sufficient number of fast tankers to supply the fleet when engaged in major service operations.

Elizabeth M. Sheets, daughter of Harold F. Sheets, vice-president of Socony-Vacuum, breaks the traditional bottle of champagne on the bow of the world's largest electrically welded tanker.

▼

All Welded Tanker Launched by Socony-Vacuum

FIRST TANKER of its class of all welded construction to be built in America and one of the initial units in the $5,000,000 shipbuilding program of Socony-Vacuum Oil Company the POUGHKEEPSIE SOCONY took the water from the ways of United Dry Docks, Staten Island, New York, on August 3. She was speeded on her way by Miss Elizabeth M. Sheets, charming daughter of Harold F. Sheets, vice president of Socony-Vacuum.

POUGHKEEPSIE SOCONY is a bulk oil carrier of 1,242 gross tons and 13,500 bbl. cargo capacity designed for the Canal-Great Lakes service of the company. Propulsion is through twin screws driven by Diesel engines of the direct, reversible, air-injection type, 375 BHP each. Aside from her welded hull construction she is in all respects similar to her companion vessels, NEW HAVEN SOCONY and PLATTSBURGH SOCONY, previously completed.

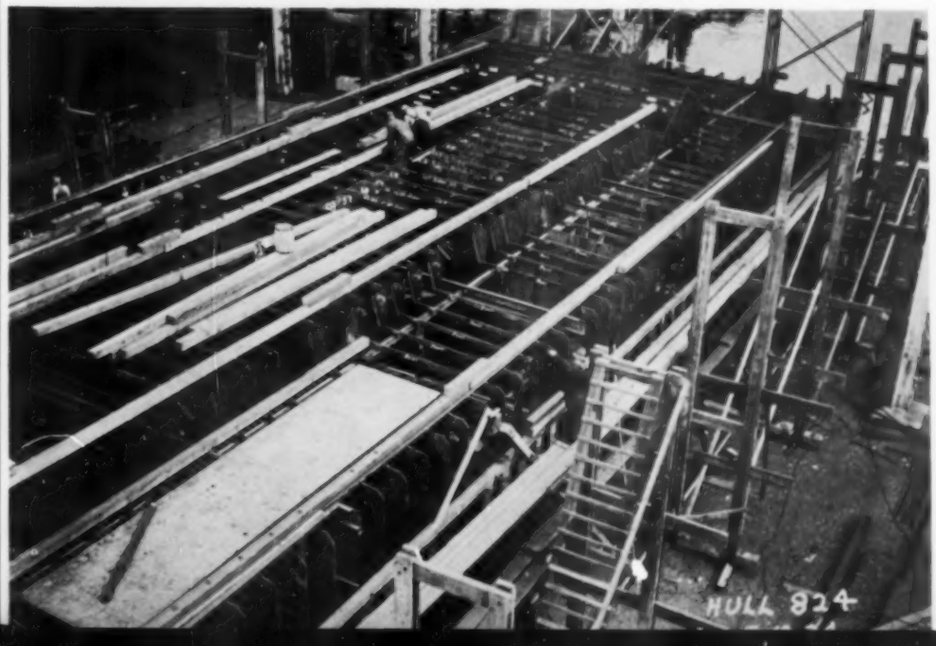
Nicholas J. Pluymert, Socony-Vacuum naval architect, in a discussion following the launching, stressed the standardized character of his company's fleet. At the same time, he called the introduction of the all-welded ship a most drastic challenge to the older type riveted vessels.

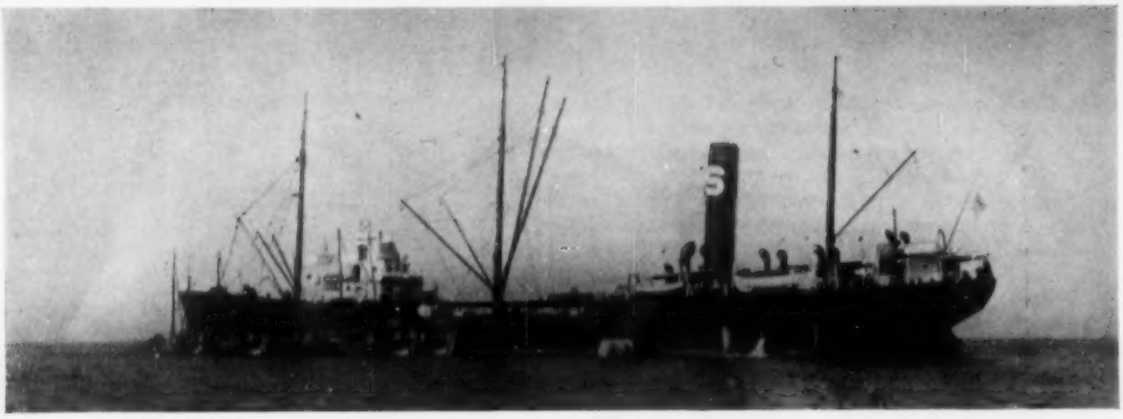
"While the all-welded hull is no newcomer among service vessels of smaller size and Government craft," said Mr. Pluymert, "there doubtless will be some who will regard as revolutionary the use of that method for such a vessel as the POUGHKEEPSIE SOCONY. We feel, however, that little more than pioneering courage was required to take advantage of this great advancement in the shipbuilding art and to seize for ourselves the far-reaching economies made possible by the all-welded design. Our fleet is the product of long-continued study and development and this step is no exception.

"As ship operators, planning to gain the utmost from cheap water transport, we could not overlook the lower initial cost nor the immediate saving of fifty tons in weight, which permits fifty tons of additional cargo to be carried as long as the vessel runs. It is possible that from this source we might gain a full 'free trip' every year or so.

"The elimination of 217,000 rivets and the substitution therefor of 108,000 lineal feet of electric welding is in large part responsible for the large weight saving, but the use of lighter, stronger members also contributes to the result. When the time comes that steel fabricators provide appropriately-designed shapes for electric welding, I predict new economies that will be even harder to ignore."

Poughkeepsie-Socony, all welded tanker, under construction.





Tanker "El Segundo" which recently returned from the Standard of California's Bahrein concession in the Persian Gulf with a small cargo of crude for analysis.

Bahrein Becomes Factor in International Oil

Completion of Terminal Facilities and Submarine Pipe Line to Persian Gulf Loading Station Paves Way for Shipment of Islands' Production.

ON AUGUST 1 the first oil ever imported into the United States from the Island of Bahrein, in the far-distant Persian Gulf, was delivered to the Richmond refinery of Standard Oil Company of California by the tanker EL SEGUNDO. It can hardly be called an importation as the bulk of EL SEGUNDO'S cargo, 25,000 bbl., had been discharged in Yokohama. The small portion brought to California was merely for testing and analysis to determine the qualities of Bahrein crude.

The real significance in the completion of EL SEGUNDO'S voyage is that it marks the second stage in the development of the Bahrein field which is now in production and is equipped with facilities for the regular shipment of crude. It was to provide these facilities, including tanks, a submarine pipeline and a loading terminal, that the tanker's voyage originally was undertaken on December 30, 1933.

The inception of Bahrein development goes back to 1930 when the Bahrein Petroleum Co. Ltd., subsidiary of the Standard Oil Company of California, began a geological survey of the islands under the terms of an agreement with the Sheik Hamad bin Isa al Khalifah, hereditary ruler of the 230 square mile state of Bahrein. In 1931 drilling was begun near the southern base of Bahrein's one important mountain, Jebel Dukhan, "mountain of mists" which rises 450 ft. from a depression near the centre of the main island.

In June 1932 the discovery well, Jebel Dukhan No. 1, was brought in at a depth of 2,008 ft. It was shortly followed by Jebel Dukhan No. 2 which developed a flow of about 1,500 bbl. at approximately the same depth. These two wells were put down with cable tools but subsequently a rotary drilling rig was installed and other wells were drilled to greater depths and in locations north and west of the mountain. By the end of 1933 six wells had been sunk and it was demonstrated that the field was capable of sustained production. To handle the output of the wells, pipeline, storage and loading facilities were necessary. It was to supply this need that the EL SEGUNDO was sent out bearing a full load of equipment and a party of engineers, structural workers, welders and others to supervise and handle the work requiring expert knowledge. For ordinary labor natives of Bahrein were employed.

For the purpose of collecting the oil and delivering it to the shore station, gathering lines of 6-in. and 8-in. pipe were laid partly above the surface and partly in trenches. Where the line runs above ground it is supported on masonry anchor blocks and bends are provided to take care of longitudinal expansion and contraction caused by changes in temperature. The movement of oil through the line is a simple matter since it flows by gravity from the wells to a low point in the system, is pumped over the slight rise that rims the interior of the island and is carried by gravity to the tanks at tidewater.

The terminal is located on a small island, Sitrah, separated from the main island by a shallow channel across which a causeway and trestle have been built. Piles of teakwood from India and timbers of California pine were used in this part of the construction. The official opening of the bridge connecting the two islands was an event of local importance and the ceremonies were graced by the attendance of Sheik Hamad and his court.

Three working tanks equipped with floating roofs and having a capacity of 250,000 bbl. have been erected. The shells were brought from California, together with riveting and welding outfits for their erection. Native workers quickly learned to handle hot rivets and rivet-yokes and soon acquired proficiency with paint brushes when the completed tanks were covered with red lead and aluminum paint. A tank of 7,500 bbl. capacity was also erected to receive ballast water from incoming ships as the company exercises every care to prevent the discharge of oily water into the Gulf.

A dust-proof pumphouse built of stone and metal contains four 225 HP gasoline engines direct connected through a vapor-proof partition to four centrifugal pumps which deliver oil through a 16,000-ft. sea line into ships' tanks at any desired rate of flow up to 5,700 bbl. per hour. This high capacity has been designed to reduce loading time to a minimum although the

terminal facilities were designed to handle only 10,000 bbl. per day.

The most interesting and unusual feature of the Bahrein terminal is the submarine pipeline which extends over three miles from shore to the tanker anchorage. For the first mile the water is so shoal that parts of the line are exposed at low tide. The line itself is supported by masonry piers for a distance of 5,700 ft. In building this section of the line it was possible to use tractors and motor trucks although at times they were working in a foot or more of water. The remaining portion of the line rests on the sloping bottom of the Gulf, the depth reaching about 50 ft. at the outer terminus.

For assembling the pipe used in these sections the construction crew utilized a pier 800 ft. in length which had been built for the landing of freight from native dhouws. Industrial railway tracks were laid along the edge of the pier where the lengths of pipe were lined up on wheeled dollies and welded together in 500-foot sections and the two ends closed with blind flanges. Then with tractor-derricks and rope-slings the sections were slid into the water at high tide, suspended beneath floats, and towed by power-boats to position. There metal horses and chainfalls lifted and held the pipe in place while the flanges were cut off by acetylene torches and the section-ends welded together.

Thus a second mile of sea-line was formed. But instead of welding this to the pier-supported portion a cable was brought in from the anchored tanker, attached to the floating line, and by winch-power the whole mile of pipe was hauled out until its discharge end was in position in deep water. Then the intervening mile was filled in and the three divisions connected up. Early in June the final welds were made, the loading hose and connections were attached and the oil that had been piped from the wells was pumped from the tanks to the ship. On June 7 the first cargo of Bahrein oil left the loading station when EL SEGUNDO sailed for San Francisco via Singapore and Yokohama and Bahrein became linked with the world wide fabric of the international oil industry.

Near its group of wells in the central portion of the island the company is constructing a new camp or village with comfortable buildings of limestone rock set in "gutch," or Bahrein plaster, according to the native custom. This village will include cottages, bunk houses, a recreation hall, a machine shop and other buildings. To serve the members of the community a fresh water tank of 5,000 bbl. capacity has been erected on Jebel Dukhan and this water is piped to the camp. The original Jebel Camp, built

Tying in a 500 ft. section of sea line

Lining up pipe on sea line pier

Pumping plant and sea line, taken from the top of bilge water tanks

when drilling operations were first begun, is composed of Nissen huts with corrugated iron sides and roofs plastered with mud as a protection against the sun's heat. The new camp is a great improvement.

A telephone line has been built between the producing unit and the terminal while short wave radio telephone units provide a means of communication between the terminal and the loading station.

Noteworthy in the construction of the Bahrein terminal and submarine pipeline is the smoothness with which the work has progressed. It was completed well ahead of the time scheduled. Although far from a supply base the requirements for the construction work had been so fully anticipated that there was no serious delay at any point and there were no major accidents during the work.

Another point worth mentioning is the friendly relations that have been maintained at all times between the company's officials and the native population. Sheik Hamad has shown a keen interest in the work in all its stages and prior to the departure of EL SEGUNDO he presented to the captain a complete Arab costume in token of his friendly esteem.

What part Bahrein is destined to play in the drama of international oil remains for the future to determine. That it will be a factor, though perhaps not occupying a major role, is certain. For the present the island is reported as being able to supply 100,000 to 150,000 bbl. of oil monthly for which a place must be found somewhere in the international market.

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Value of British Petroleum Product Imports Decreases

First Half Year Shows Increase in Quantity and Decrease in Value of Petroleum Products Imported. Crude Quantity and Value Increase. London Suburban Service Stations Regulated.

LONDON.

LOWER prices for petroleum products during the first half of 1934 robbed the British distributing industry of the benefit which it would otherwise have derived from increased demand.

Total imports for the six months to June 30, shown in the accompanying tables at 38,341,343 bbl. were 10.5 percent higher than for the corresponding period of 1933, and advanced by 17.2 percent compared with 1932.

Apart from the special products included in the official statistics under the heading "other sorts," the largest increase on last year among individual products was in kerosene. In part, this increase partially makes good the decline in kerosene imports last year against 1932. During the first half of 1934 a considerably larger quantity of this product has come from the United States, which has filled the gap left by smaller shipments from Russia and Roumania.

Gas oil and fuel oil imports also show relatively big advances on the volume brought in last year, the larger imports being attributed to a higher level of general commercial activity. The fuel oil figures, in particular, are notable for steady increase in spite of the tax imposed on heavy oils in last year's British Budget.

Russian shipments of lubricating oil, which were nearly double the 1933 figure, were entirely responsible for the increase of 6.3 percent in this category. Little change occurred in lubricating oil shipments from other countries. As in the case of lamp oil, however, 1934 imports to the end of June were below the totals for the first six months of 1932.

While Russian lubricating oil imports were much larger this year than last, the price obtained for them also improved substantially. One explanation for this is that Russian prices were formerly so low that an advance could take place in the Soviets' prices without raising them to a particularly high level relative to the general level of lubricating oil in the British market.

Although sales of motor spirit in Britain have been reported to be moderately active, this product shows an improvement of only one percent on the volume of 1933 imports. This is partly explained by the fact that a relatively large increase in imports of motor spirit took place last year. Against 1932, the total motor spirit shipments advanced this year by 14.4 percent, whereas the total of all refined products advanced by only 12.4 percent.

The continued expansion of shipments of crude oil also explains the comparatively small increase in motor spirit imports. Imports of crude for the six months rose by 30 percent to 7,153,086 bbl., Persia contributing largely to the increase with an increase of 452,229 bbl.

Value and Quantity of British Petroleum Imports for First Half of 1934

	Six months to June 30th, 1934 (Barrels)	Percentage Change on 1933 in Quantity	Percentage Change on 1932 in Quantity	Six months to June 30th, 1934 (£)	Percentage Change on 1933 in Value	Percentage Change on 1932 in Value
Lamp Oil	3,122,171	+22.7	− 8.0	1,206,998	− 1.7	−24.8
Motor Spirit	15,749,686	+ 1.0	+14.4	7,831,569	− 5.0	− 1.0
Lubricating Oil	1,470,400	+ 6.3	− 1.7	1,824,069	− 6.5	−18.8
Gas Oil	1,876,029	+15.6	+13.2	666,087	+ 7.9	+15.2
Fuel Oil	8,634,657	+10.4	+20.6	2,272,733	+ 4.0	+20.2
Other Sorts	335,314	+51.5	+30.6	169,180	+50.1	+36.8
Total Products	31,188,257	+ 6.9	+12.4	13,970,636	− 2.5	− 2.7
Crude	7,153,086	+30.0	+43.8	2,092,922	+25.0	+37.0
Total Imports	38,341,343	+10.5	+17.2	16,063,558	+ 0.3	+ 1.1

to 3,684,857 bbl. An even larger advance was made in crude shipments classified as "from other foreign countries," which probably includes Peru and Mexico.

Against the general rise in the volume of arrivals, the value statistics for the six months make an unfavourable showing. Although volume of all petroleum imports, including crude increased by 10.5 percent, the value was only fractionally higher, and even this result was only achieved owing to the higher declared price of the crude put through the Customs.

The operation of lower prices is well illustrated by the import figures for kerosene, which, although showing a volume increase on 1933 of 22.7 percent, were lower in value by 1.7 percent.

Small increases in the amount of motor spirit and lubricating oil were turned into declines on the six months in the value figures, while improvements in imports of gas and fuel oil were considerably reduced by the price factor.

The declared value of the crude brought in from Persia, almost entirely by the Anglo-Persian, did not show a rise proportionate to the larger volume, so that the actual value per barrel was less than last year. This was offset by an advance in the value of crude brought in from other foreign countries. Against 1933, this showed an increase of 77.8 percent, against an increase of only 68.0 percent in the volume of crude imported. Although, judging from the six months' statistics alone, no very favourable conclusions on price trends can be drawn, the value of imports, barrel for barrel, taken over the whole period was slightly more favourable than during the first quarter of the year. This implies a slight upward turn of prices in the second quarter. It is also possible that the very small advance of 0.3 percent in value of all petroleum imports for the six months as against the corresponding period of 1933 was slightly increased as far as profitability was concerned. Improvement in methods of further treatment and in marketing are factors which may have turned a fractional increase in imports into an appreciable improvement in net sales values.

Regulations for petrol filling stations passed last month by the London County Council bring London into line with many other important areas, where new filling station construction is either prohibited altogether, or closely supervised.

London's new measure is important principally on account of the large area which it covers. The total ground administered by the Council is 117 square miles, covering scattered but valuable manufacturing districts and a population of about 4,500,000.

Restrictions of the most stringent kind are already in operation in the Central London district. They make the erection of new stations almost an impossibility, apply the strictest control of pumps, and have sometimes come under criticism from petrol distributors on the ground that they are unduly oppressive, and constitute a serious limitation on business.

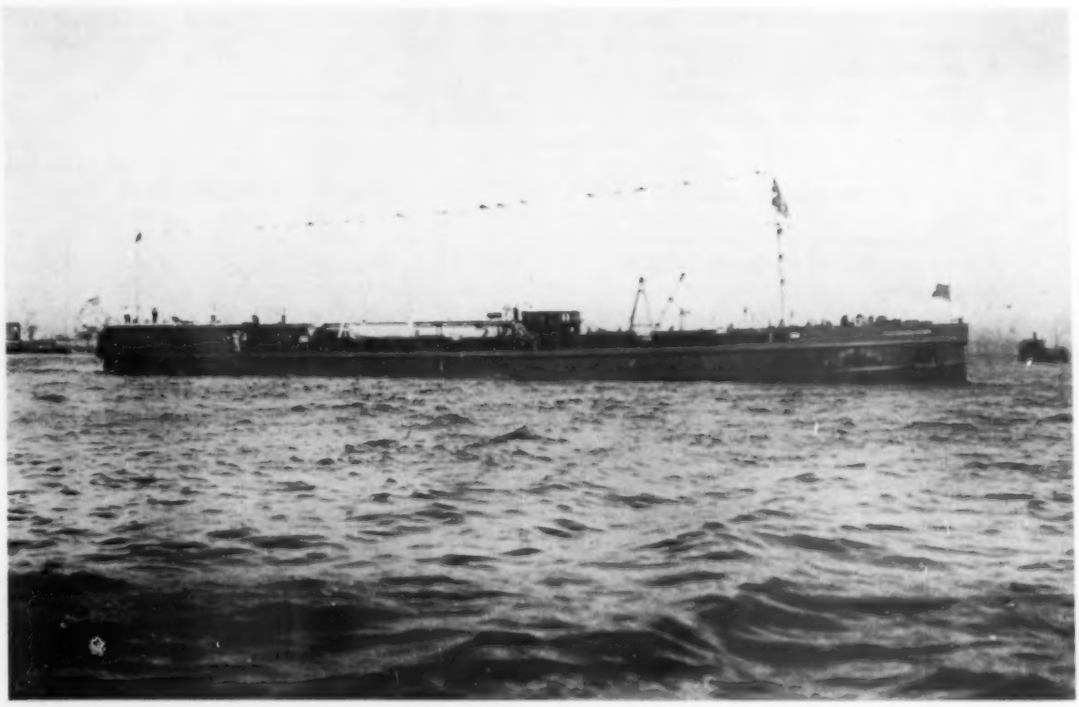
Outer London districts, some of them of a semi-rural type, will be principally affected by the new regulations. The new control is designed to preserve the appearance of public places, and prevent their disfigurement by vendors of motor spirit.

Regulations with this end in view follow the lines of those previously adopted elsewhere. Power has been taken to control the erection of pumps, signs and lettering on motor spirit stations, and general colour schemes of buildings.

Responsible petrol distributing companies operating in the British market have always been favourably disposed towards measures to improve the appearance of motor spirit dealers' premises.

Unrestricted expansion of the retail petrol trade, which coincided with the post-war development of motor travel, left far too many filling stations with an appearance which disfigured urban streets as well as the countryside. The movement for regulation helps the petrol distributing business in so far as it removes one of the reproaches sometimes levelled at it.

Great Britain is already plentifully supplied with retail petrol stations, and steps to restrict the further growth of unsightly retail buildings have no effect on the possibilities of the market from the importer's or bulk distributor's point of view.



The all-welded 1,242 ton tanker "Poughkeepsie Socony" recently launched for Socony-Vacuum Oil Company, a description of which appears on page 299.

Venezuela's Petroleum Balance Sheet

By Encouraging Development of Resources the Nation Has Profited More Than It Could Have Done Through Establishment of a Monopolistic Regime.

By Claudio Urrûtia

Civil Attaché
Venezuelan Legation to U. S. A.

PETROLEUM is a subject on which the policies of the oil producing countries of the world differ widely. The past few years have placed a severe strain upon national budgets as well as upon individual pocketbooks and to the average observer it would seem that harassed legislators the world over had clutched in their extremity at the petroleum industry as a drowning man at a life preserver, little realizing that in many cases they were slowly strangling it out of existence.

Actually, however, the trouble goes much deeper than that. The temptation to overtax oil products, while aggravated during the depression, has its root in the old fallacious impulse to "kill the goose that lays the golden eggs." The situation is different in various countries but the effect is generally the same.

In the United States, for example, the surface landowner is presumed to possess whatever lies beneath his property as well. Ownership of oil reserves therefore, except in the case of public lands, is not a government concern here as it is in most countries abroad.

In Latin America the government has a direct interest in the ownership of oil pools since title to minerals beneath the surface is vested in the nation. Unfortunately the wealth associated in the public mind with the very name of oil has led many governments to seize upon this industry even as it struggled to gain a foothold and tax it to the point of diminishing returns. Misplaced patriotic zeal and prejudice against so-called "foreign exploitation" has frequently led to attempts at nationalization of the industry, with invariably unsatisfactory results.

In Venezuela we pursue a different policy. In common with other nations we have found reasonable taxes upon the petroleum industry to be both equitable in principle and profitable in yield. We have also discovered, however, that the amount of revenue derived from oil, like that from any enterprise, is in direct proportion to the prosperity and well being of the industry. When the tax rate begins to pass a certain point the money flowing into the public treasury dwindles.

The entrance of foreign capital into the development of Venezuelan oil reserves has been welcomed. After studying the experience of other nations we concluded that the combination of our national resources, labor and materials with foreign capital and operating experience was a sound partnership and one which promised the greatest return to the country, at the lowest cost and with the minimum of risk. Statistics over the past few years have borne out the wisdom of this policy.

For the last six years Venezuela has averaged around 115,000,000 bbl. of production annually. The amount of money spent in Venezuela on account of petroleum production was more than $36,000,000. Of this sum $8,900,000 went to the national treasury. The Venezuela Finance Department estimates that the revenue from mines ranks second in the national income. The remainder, $27,000,000—three times the sum received by the treasury—also flowed into Venezuela for wages, work and general expenses.

Other figures, although not quite so up to date, indicate that at least 50 percent of the cost of a barrel of crude is invested within the borders of the country.

Furthermore, the money coming into the country from petroleum exported has been larger than the total value of all other exports. We have estimated that the government and people of Venezuela receive at least 37 percent of the gross value of the petroleum shipped out of the country.

Many who have not had an opportunity to familiarize themselves with the situation have been under the impression that the whole income from petroleum production remains in the pockets of the foreign companies developing it. The experience of Venezuela in this respect is enlightening.

The total public income of Venezuela in the six fiscal years up to June, 1933, was about $47,000,000. Of this sum 22.5 percent represented income from the petroleum industry. For every $100 leaving the national treasury to go to employees, road construction, health promotion and purchases from the merchants of the country, $22,50 comes from oil revenue—and, as was already explained, every dollar received by the government from petroleum taxes was matched by three dollars spent by the oil companies themselves within the country.

Standard Oil Company of Venezuela goes even further. In its report dated January 30, 1932, to the Department of Fomento the company says, "For every bolivar the company received for its products, as a result of its considerable investments in Venezuela, the company paid to the nation .23 of a bolivar in taxes, .17 to Venezuelan citizens in salaries and wages (salaries paid to foreigners not included), and invested the rest in buildings and general works . . . and furthermore, after spending in Venezuela all the money received for its products, it had to contribute .6 for every bolivar out of the capital of the company."

From this statement it will be seen that the Standard paid 22¢ in taxes of each dollar it received from the sale of products during that year, and 78¢ in wages to Venezuelan workmen and expenses within the company. That is, Venezuela received from this company in money through payment of wages and work almost the equal of four times what the treasury realized in taxes.

A wider distribution of money coming from a source of national wealth which as such belongs chiefly to all Venezuelans can hardly be imagined. In the last analysis the income from petroleum which passes to private citizens through the government enriches all industries and benefits all Venezuelans. If the government were deprived of this income it would have to reduce its expenses 22.5 percent, the money would no longer circulate, taxes in other lines would have to be increased, and the whole economic structure of the country would suffer. Excepting customs, there is no other public income which plays a more important part in the economic life of the nation.

At the present time there is probably no industrial enterprise (except monopolies) managed by any government which regularly pays a profit. As a very rare example there is the case of Germany with its railroads. Before the World War the Imperial Government managed them with some success, but this is no longer true. This principle is general, and I do not even exclude Russia. The Soviet government

Standard of Venezuela's Cumerabo camp.

confiscated all petroleum properties within the boundaries of the USSR. They entered upon their program of development with high enthusiasm and passed Venezuela in annual crude production, petroleum output having been restricted in the latter country in view of the over-production prices within the industry. One factor affected the Russian plan. Transport and distribution facilities cannot be improvised or obtained without cost, with the result that the Russian petroleum industry is still facing a crisis in that respect.

The reason I cite this experience is that we have often heard the argument that if we Venezuelans who import eggs, potatoes and even the bread we eat, should exploit our own petroleum we would all be potentates.

The argument deserves an answer, and I will try and give figures to show what would have happened if the government of Venezuela had gone into the petroleum business—even under the very doubtful supposition that we could have found within our own borders personnel capable of carrying on operations requiring long experience and high technical skill.

Let us suppose that it had been decided to develop petroleum for the account of the nation instead of giving out concessions. In order to carry on this development the Venezuelan government would have been obliged to negotiate a loan at least equal to the capital now invested in the oil industry in that country, which is, in round numbers, about $352,000,000. Taking the years 1927–1932 as a basis, the largest gross income which could be expected from such operations would be $90,400,000 a year. Let us even suppose that, not counting the government's royalty, a liquid profit of 20 percent could be earned (the Tariff Commission figured profit from petroleum at barely five percent). Under this supposition the profit would amount to $18,080,000—a return on the capital invested of only 5.13 percent per annum.

Supposing that the loan had been secured at a 6 percent rate and that such interest had not been paid until the operation was in full swing, the government would have been forced to take out of its national treasury more than three million dollars to cover the difference on income alone. To this would have been added the loss of $8,900,000 annually which the treasury is now averaging from petroleum taxes. So, for the pleasure of experimenting with the oil business, the Venezuelan government would have had to pay out of its own pocket, at a modest calculation, at least $11,991,000.

Common sense, as well as the experience of Venezuela as compared with that of Mexico and certain other countries, tells us that the most profitable and satisfactory manner for such countries to develop their petroleum resources is in exactly the same manner in which American railroads developed and any one of the other pioneer enterprises was carried to completion throughout the world's history—namely, by the combination of foreign capital and operating experience with the government as partner. In this way producing areas are developed in the most efficient manner, the country is enriched by the spending of large sums of imported capital in local materials and for wages, and, with proper supervision, the government is assured of the maximum possible return in taxes and royalties with the minimum risk.

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Eight marketing companies have withdrawn from the German oil cartel, which now comprises only three large concerns.

Ten inch pipe ready for encasing

Maintaining 100,000 Miles of Pipeline

Gasoline driven arc welding generator for pipeline maintenance

THE maintenance and repair of pipelines has undergone a gradual evolution since arc welding was first used for pipeline work. More and more repairs are made with the arc. Today heavy cast iron stuffing boxes and weighty clamps have almost disappeared. The electric arc makes repairs which last longer, are accomplished much more quickly and which reduce costs from 50 to 90 percent.

In addition to the speed and effectiveness with which welded repairs are made on pipelines, the permanence of the repair is a great and obvious advantage. Pipeline failures and leaks almost never occur where a properly welded repair job has been done. Research and practice during the last few years have resulted in standardized repair procedure which is used on thousands of miles of line. The practice followed by one of the largest American pipeline companies will be outlined here by an official of that company. The photographs illustrating this article and showing various stages in the repair of pipelines are published through the courtesy of the Lincoln Electric Company.

Shielded arc welded joint encasing badly corroded pipe.

PIPE WALKERS patrol the lines constantly. These men ordinarily travel back and forth between one pumping station and the next, a distance of approximately 50 to 60 miles. The high pressure lines are covered twice each week and the low pressure lines once a week. Leaks discovered by oil appearing on the surface are reported immediately. In the north such leaks are repaired only temporarily in the winter. These temporary repairs are replaced with permanent repairs with the coming of warm weather. Where many leaks are located in one section of line, the entire section is uncovered, examined and necessary repairs made, as will be discussed later.

It has been determined that certain types of soil are much more likely to cause excessive corrosion. Marshy ground, muck, gumbo and clay are causes of corrosion. Oil seepage, tree roots, barnyard drainage and cinder fills also hasten corrosion of the lines. Hence, a knowledge of soil conditions and causes of corrosion makes it possible to determine the sections most likely to prove troublesome.

A gasoline engine-driven arc welding generator of 200 or 300 ampere capacity will handle easily the various sizes of electrodes needed for repair work. A welder mounted on rubber tired wheels proves most satisfactory for all but the roughest country. Such a machine can be towed behind a passenger car and enables the repair crew to get to the site with equipment for emergency repairs in a very short time. Some companies prefer a welder mounted on a truck which can also be used for carrying pipe, cutting equipment and other tools.

Heavily coated shielded arc electrodes in 5/32 inch to ¼ inch sizes are used by this company exclusively.

The welding foreman is responsible for the condition and upkeep of all equipment. It is his duty to inspect face shields and lenses and see that they are in good condition and properly used. The foreman also sees that every welding machine is equipped with a readily accessible fire extinguisher.

No welding is permitted while a line is being turned, raised, lowered or moved in any manner. Where welding machines are in proximity to the handling of the line, the motors are stopped. No caulking is allowed within 200 ft. of any welding operation or welding machine running idle, nor is welding permitted while the line is under strain. Overhead welding is kept to a minimum.

Contrary to general opinion, lines filled with oil but not under pressure, old empty lines, and lines filled with water constitute a greater explosion hazard than oil lines under pressure. Before any welding repairs are made on these lines, a hole is cut in the lines to allow the escape of gases. This hole is guarded and at sufficient distance to insure the safety of the men at work.

No welding is allowed on empty lines which open into used tanks.

No oil is ever turned into welded lines until the line is thoroughly cooled.

It is particularly important that the ground connection of the welding machine shall always be fastened to the line that is being welded. Under no circumstances is a welder allowed to work on any other line than that to which the ground connection is fastened. This prevents the welder circuit from going through a dry tank where a spark at a loose connection would cause an explosion.

Until a comparatively few years ago, most lines were put down with screwed or coupled joints and it is these lines for the most part which are in need of reconditioning today. Ordinarily a line does not give trouble until it is at least eight years old unless the service conditions are unusually severe or it has been improperly laid.

There are hundreds of miles of 8, 10 and 12 inch lines which date back as far as 1907. Naturally many of these old, screwed lines require not a little maintenance work.

The most important reconditioning service is remedying the effects of corrosion. Unlike atmospheric corrosion, which occurs slowly over the entire surface, soil corrosion is usually localized and more

Cleaning machine in operation.

rapid, resulting in pitting. These pits become deeper and deeper and eventually cause a leak in the line.

After the pipe is uncovered a cleaning machine is employed to remove the dirt remaining on the pipe.

After cleaning the pipe is often found covered with pit holes. The line is thoroughly inspected, necessary patching and collar welds marked, the pits gauged and so marked that pipe walls having less than 1/16 inch thickness are easily noted. Pits with less than 1/16 inch wall thickness are partly filled with metallic buttons or ends of electrode before welding. Welding is accomplished with a quick, circular motion of the electrode. The action of the arc drives out the rust and fills the depression with pure corrosion-resisting iron. Only the electric arc can be used for such repairs.

Where pits are close together or the pipe thickness is less than 1/16 inch, a patch is welded over the defective area. Patches may be cut from old pipe of the same diameter. (One large company has recently followed the practice of purchasing the blanks obtained from a boiler shop punching out flues and using these for patches.)

Patches are usually cut from the same size pipe as that in the line being repaired. If pits cover a large area, the best practice calls for welding on a long slab or half sole. If, for example, a ten inch line is being repaired, a slab is cut from ten inch pipe a little past center, placed over the line and sledged so that it will conform to the curve of the line being repaired. It is then clamped in place, tack welded and then continuous welded on all sides. In case a long slab or half sole is used, U bolts and cross bars are often used to draw it in place. Or it may be forced into position with truck jacks and log chains.

It is frequently found that the bottom half of the pipe, where it rests against the ground is badly pitted while the upper half is in good condition. A half sole on the bottom of the pipe electrically welded to the pipe all around adequately protects the pipe for many long years. Without the use of the arc, it would be necessary to shut down the line, drain it, and put in a new section of pipe. If the line cannot be drained it is necessary to fill with water, with considerable loss of time due to the pumping, and the removal of the water after the repair.

Pit leaks may be responsible for large oil losses. When such leaks are discovered either by the line walker or by a drop in pressure at the pumping station, a repair is made immediately. One man can place a patch, with a gasket under it, over the leak and clamp it in place. This is a temporary repair. In due

Half sole applied to bottom of pipe.

time the patch is securely welded to the line.

If, when the pipe is uncovered, many large and deep pits are noticed in the vicinity of the leak, and they cannot be half-soled or patched, the pipe is completely encased.

The casing is made from pipe of larger diameter than the line or a combination of the same size and larger diameter than the line. In the latter case, by taking three joints of pipe and splitting two of them lengthwise at a point past center and one through center, casings will be supplied for two joints. The pieces left over may be used for patches. The half pipe is then placed on the top of the pipe, and the larger section underneath. Since the lower section extends up over the edge of the top section, welding is particularly easy.

Where larger diameter pipe is used for both sections the longitudinal welds are butt welds. Such welds, in the vertical position, are more difficult to make than the weld described above.

In the case of bends or sags in the line it is necessary to use short sections to correspond with the bends. One end of the casing in each section is belled out and welded to the next section. The end of the casing is belled down and welded to the line.

Even if the line is especially bad for a long distance, with welding it has not been found necessary to displace the oil with water in order to make the necessary repairs.

This makes possible an appreciable saving in cost of repairs compared with the old method. In addition to the cost of putting water in the line, pumping it off into a special tank and then siphoning the water out, the revenue of the thousands of barrels of oil that should be in transit is lost and can never be made up. Elimination of just one such shutdown in a year will more than pay the cost of all welding equipment.

Encasing ten inch pipe.

Badly corroded pipe in foreground.

Many old lines are covered with patches, saddles and clamps. In the majority of cases, the gaskets underneath the patch can be cut out back a short distance, the patch pounded down against the pipe and tack welded in position so that the clamp can be removed and the patch solidly welded to the pipe.

Two methods are used for repairing coupling leaks. The coupling may be welded directly to the pipe or a swaged, split sleeve may be used. Whenever the leak is bad or the coupling appears to be weak, the split sleeve is used. Where the coupling is welded direct, a stringer bead is run around the pipe, leaving a one-inch opening at the top for the escape of gases. A finishing bead is then put on, still leaving the small opening at the top.

Replacing an eight inch line at a river crossing.

A small piece of welding rod is put in the opening and the welding completed.

The split sleeve consists of two halves of pipe of the proper length swaged to fit over the coupling. The lower half has a threaded ¾-inch drain hole left in the bottom. The coupling is thoroughly caulked and the sleeve placed in position. Before welding, a ¾-inch line is laid to carry the oil a safe distance from the sleeve being welded. Both halves of the sleeve are tacked in position. The longitudinal welds are made first, then the lower halves of end welds, then the top halves. On completion of the welding, the ¾-inch line is removed and the small hole plugged with ¾-inch plug. The result of such a welded repair job is permanent. Whereas a stuffing box for a 12 inch pipe costs approximately $175 plus $40 or $50 to install, a welded sleeve costs less than $40 installed.

For unusually bad leaks or split joints, it is often necessary to drain the line and weld in a new section. This may be necessary also in the case of defective pipe at river crossings, although our company has made repairs to lines crossing the Ohio and other rivers with the aid of divers.

After all necessary repairs have been made, the line is painted with lead base priming coat. This is followed by two coats of tar and a wrapping of asbestos paper which is applied by a wrapping machine which does an efficient job. This machine makes a tight band between the wrapping and the hot tar.

Our experience has been that the electric arc welding process is responsible for definite and substantial savings in time and money in making pipeline repairs. Savings are made with welded patches over the cost of heavy clamps and gasketed patches. Other welded repairs are made which formerly would have required putting in a new section of pipe. Most important of all is the fact that a welded repair is permanent, and the line at no time need be shut down.

It is very seldom that there is leakage of a properly made weld. Electric welding provides an efficient method for putting in branch connections and for building of new lines. Experience indicates that maintenance on lines with arc welded joints will not be nearly as heavy as that required for lines with old type joints.

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The Finnish Oil Market

THE FINNISH REPUBLIC did not become automobile conscious until about 10 years ago. Under Russian rule the automobile did not make the impression on the Finns that it did on other Scandinavian peoples; and even four years after the adoption of the Finnish constitution, there were only 3000 motor vehicles for a country embracing 400,000 square kilometers and containing 3,500,000 inhabitants. At the end of 1933 the number of cars had risen close to 40,000.

Twelve percent of the area of Finland is occupied by lakes and more than half is thinly populated, for climatic reasons. The railroad system of the country measures about 5300 kilometers of main line. Construction of new rail lines is considered less practicable than the building of highways, and the government is devoting considerable energy to this work.

In spite of encouragement given to wood-fired gas generator vehicles the total imports of petroleum products in 1933 showed an increase of 25 percent over 1932. The lion's share of this increase fell to gasoline, which jumped from 28,000 metric tons in 1932 to 60,000 in 1933; this more than doubling of the consumption of gasoline is regarded as a sign that the depression has at last been overcome. On the other hand the imports of lamp oils showed a slump from 44,000 tons to 36,000. This decreased consumption of lamp oils is ascribed on the one hand to the progressive electrification of the country, and on the other hand to the increasing substitution of the heavier fuel oils for the lighter oils for driving Diesel and other internal combustion engines. An increase of imports of fuel oil from 10,000 tons in 1932 to 13,600 tons in 1933 is a sign of this substitution. The steady increase in motorization of the Finnish merchant marine is another factor tending to increase business in fuel oils.

The shares of this import business that fall to the various producing countries show great variations, but in the main the United States is among the principal suppliers. Russia's participation in this market fluctuates considerably. Imports from England have shown a steady increase since 1931.

Foreign Oil Legion

EXPRESSING moderate optimism as to the outlook for the oil industry and insisting that improvement of the monetary status of silver will add to the prosperity and buying power of a billion of the world's population, Sir Henri Deterding, executive chief of the Royal Dutch Shell Group, paid a fleeting ten days' visit to America in late August. In a press interview on the eve of his return to London, Sir Henri said he felt sure that means would be found for curbing illegal production of oil in the United States and that this would have an important influence toward international stability. Until the American industry had put its house in order, producers in other countries could see little purpose in regulating their output.

Pointing out that the excess of production over market requirements had amounted to only about six percent, Sir Henri said that it should not be difficult to deal with this, particularly in view of the constant increase in demand which is taking place in all parts of the world. Asked if he believed that leading interests in the oil industry were more inclined than in the past to work together for the good of the industry, Sir Henri said that he believed this to be true because the world was constantly getting smaller and the opportunities for leaders of the industry to know each other and to understand one another's plans and purposes were greater than ever before.

In Sir Henri's opinion oil is certain to occupy a position of increasing importance.

Sir Henri Deterding

George Legh-Jones

JAMES A. MOFFETT has resigned as vice president of the Standard Oil Company of California to devote all his time to the Federal Housing Administration. The oil company's board of directors accepted the resignation at the urgent insistence of Mr. Moffett. He said he found his duties as administrator would demand his attention indefinitely.

GEORGE LEGH-JONES, former President of the Shell Oil Company, has been called to London where he will take an important part in the management of the worldwide interests of the Royal Dutch Shell Group.

This news has been anticipated for some time by those intimately connected with the oil business as in his new position there will be a wider scope for Legh-Jones' outstanding talents as an oil man and his experience of the oil business of the United States.

Legh-Jones will be Sir Henri Deterding's immediate assistant and will be directly in charge of the Royal Dutch Shell Group's interests both in North and South America.

SIDNEY BELITHER was elected President of the Shell Oil Company on August 6, 1934. For over a year prior to that time Mr. Belither was Executive Vice President of Shell Oil Company and was formerly Assistant to the President of Shell Union Oil Corporation, New York.

Mr. Belither has had over fifteen years' experience in all branches of the oil business in Shell interests throughout the world. He is a member of the Board of Governors of the Pacific Coast Petroleum Agency.

Sidney Belither

World Oil Production — Official Figures for 1934 Revised

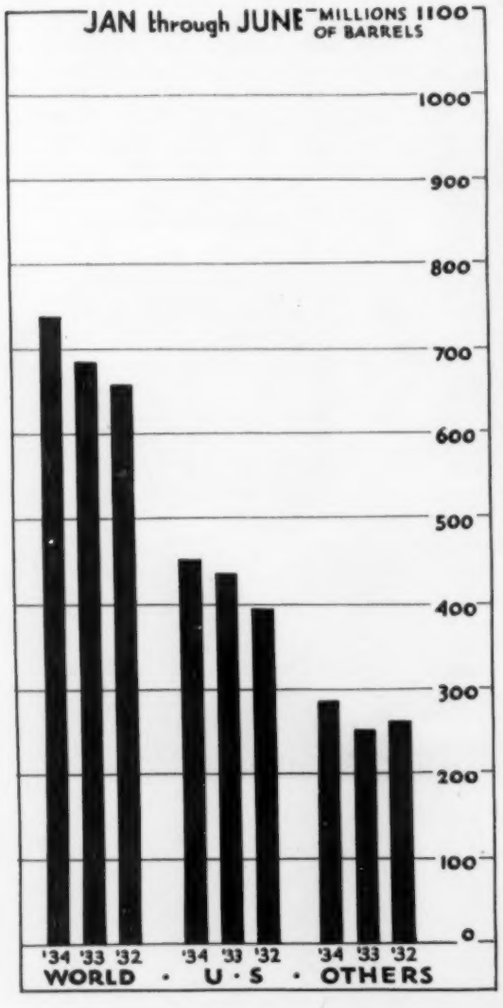
All figures furnished direct to WORLD PETROLEUM by Governments, except where otherwise specified

(Figures in U. S. Barrels—Conversion ratio 7 bbl. = 1 ton)

Country	July 1933	August 1933	September 1933	October 1933	November 1933	December 1933	January 1934	February 1934	March 1934	April 1934	May 1934	June 1934
United States	84,387,000	85,239,000	78,186,000	76,017,000	69,755,000	72,060,000	71,976,000	65,450,000	75,548,000	75,796,000	79,870,000	80,040,000
Russia	11,837,000	13,402,200	14,340,200	14,595,000	13,479,200	12,591,600	13,356,000	12,488,900	14,644,000	14,081,900	14,315,000	13,966,400
Venezuela	10,197,425	10,367,511	10,231,410	10,852,653	10,843,910	11,253,704	11,091,415	9,921,765	11,238,717	11,185,076	11,768,799	12,500,307
Roumania	4,755,600	4,562,551	4,420,486	4,502,127	4,000,000	4,515,000	4,906,000	4,440,000	5,066,000	4,981,000	5,258,000	5,228,000
Persia[2]	4,648,000	4,669,000	4,109,000	4,549,867	4,199,797	4,422,096	4,164,790	3,988,502	4,483,535	4,284,231	4,648,105	4,399,045
Mexico	2,950,803	2,893,211	2,605,840	2,429,072	2,833,630	3,259,258	3,113,707	2,863,088	3,183,923	3,206,490	2,714,828	2,918,793
Netherland India	3,249,428	3,172,568	3,186,435	3,179,043	3,127,047	3,414,754	3,376,674	3,185,091	3,631,726	3,489,024	3,609,816	3,577,056
Colombia[1]	1,189,655	1,164,104	1,085,885	1,087,397	999,253	995,605	1,012,780	903,471	1,017,147	1,193,736	1,730,095	1,685,691
Argentina[1]	1,180,000	1,180,000	1,180,000	1,180,000	1,180,000	1,180,000	1,180,000	1,180,000	1,180,000	1,180,000	1,180,000[1]	1,180,000
Peru[1]	1,183,527	1,284,726	1,035,338	970,427	998,066	1,178,004	1,188,540	1,041,658	1,086,827	1,037,127	1,085,192	1,187,030
Trinidad	759,076	780,929	755,676	818,184	788,970	799,484	852,189	766,254	876,544	876,950	926,785	947,122
British India	799,788	754,675	773,440	680,880	667,719	701,478	782,743	699,369	808,647	700,000[1]	700,000[1]	700,000[1]
Poland	336,553	332,934	315,000	312,956	309,624	311,500	312,333	231,946	310,800	304,500	305,592	304,437
Sarawak	196,756	194,327	182,602	186,431	179,648	176,008	172,172	158,361	176,568	166,999	166,565[1]	164,500[1]
Japan and Taiwan[1]	195,000	195,000	195,000	195,000	195,000	195,000	195,000	195,000	195,000	195,000	195,000	195,000
Egypt	136,752	143,836	133,903	125,786	128,450	127,421	122,934	109,900[1]	121,121	117,236	131,950[1]	131,950[1]
Ecuador	147,889	148,467	139,826	141,379	133,591	138,198	132,655	120,900	131,566	135,226	142,869	158,826
Canada	99,510	100,602	97,342	97,132	108,304	113,677	124,425	116,546	130,046	118,890	117,693	109,021
Germany[3]	141,414	153,174	155,778	160,951	157,808	155,491	152,292	138,593	159,096	176,071	159,103	179,480
Iraq[1]	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
France[1]	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000	46,000
Others[1]	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000
Total	128,573,176	130,920,815	123,311,161	122,263,285	114,267,017	117,770,278	118,394,748	108,231,344	124,171,263	123,407,456	129,207,392	129,752,658

[1] Estimate. [2] Anglo-Persian Oil Co. figures revised; fuel oil returned to the ground has been deducted. [3] Thuringia estimated 7,000 bbl.; official figure for Prussia. Sakhalin Russian included with Russia. Sakhalin Japanese included with Japan. [4] International Petroleum Company's figures.

Comparison of crude oil production in the United States, all other countries and total for the world during January through June, 1932, 1933 and 1934.



Official Crude Oil Production Figures for 1932, 1933 and First 6 months of 1934

(Barrels of 42 U. S. Gals.)

	Total 1932	Daily Average 1932	Total 1933	Daily Average 1933	Total 1934	Daily Average 1934
United States	785,159,000	2,145,243	898,874,000	2,462,670	448,680,000	2,478,895
Russia	149,719,000	409,070	149,901,900	407,950	82,852,200	457,746
Venezuela	119,596,512	326,766	120,882,802	331,186	67,706,178	374,067
Roumania	50,491,205	137,954	50,971,200	139,647	29,879,000	165,072
Persia	45,122,455	123,285	49,581,280	135,840	25,968,208	143,470
Mexico	32,802,285	89,624	33,904,882	92,890	18,000,829	99,447
Netherland India	39,584,027	108,153	38,512,663	105,516	20,869,387	115,300
Colombia	16,384,956	44,768	13,157,127	36,047	7,540,920	41,662
Argentina	13,166,900	35,975	13,954,800	38,232	7,080,000	39,116
Peru	9,899,266	26,026	13,923,281	38,146	6,626,374	36,609
Trinidad	10,023,780	27,387	9,560,039	26,192	5,245,844	28,983
British India	8,600,312	23,500	8,721,665	23,893	4,390,759	24,258
Poland	3,905,230	10,670	3,858,085	10,570	1,819,608	10,053
Sarawak	2,274,043	6,213	2,289,472	6,273	1,003,100	5,541
Japan and Taiwan	2,340,000	6,393	2,340,000	6,411	1,170,000	6,464
Egypt	1,742,370	4,760	1,591,495	4,360	735,091	4,061
Ecuador	1,573,857	4,300	1,622,624	4,446	822,042	4,541
Canada	1,054,373	2,880	1,147,825	3,144	716,621	3,959
Germany	1,824,019	4,983	1,712,823	4,692	964,635	5,329
Iraq	1,200,000	3,300	1,200,000	3,288	600,000	3,314
France	552,000	1,508	552,000	1,515	276,000	1,524
Others	432,000	1,180	432,000	1,184	216,000	1,193
Total	1,297,477,590	3,544,940	1,418,470,029	3,884,022	733,162,796	4,050,623

UNITED STATES

	Daily Crude Oil Production Bbl.	Daily Runs to Stills Bbl.	Total Motor Fuel Stocks Bbl.	Imports for week Bbl.	California Shipments East for week Bbl.
Week Ending July 21	2,666,500	2,590,000	60,028,000	441,000	652,000
	531,000*				
Week Ending July 28	2,630,000	2,625,000	59,286,000	747,000	366,000
	547,000*				
Week Ending Aug. 4	2,512,000	2,500,000	58,811,000	951,000	69,000
	533,500*				
Week Ending Aug. 11	2,587,500	2,540,000	57,755,000	854,000	659,000
	480,000*				
Week Ending Aug. 18	2,393,000	2,580,000	56,625,000	436,000	579,000

Underlined figures indicate improvement in statistical position—decrease in production, runs to stills, gasoline stocks and imports.
* Estimated total production of the Rusk-Gregg field, East Texas; official and unreported.

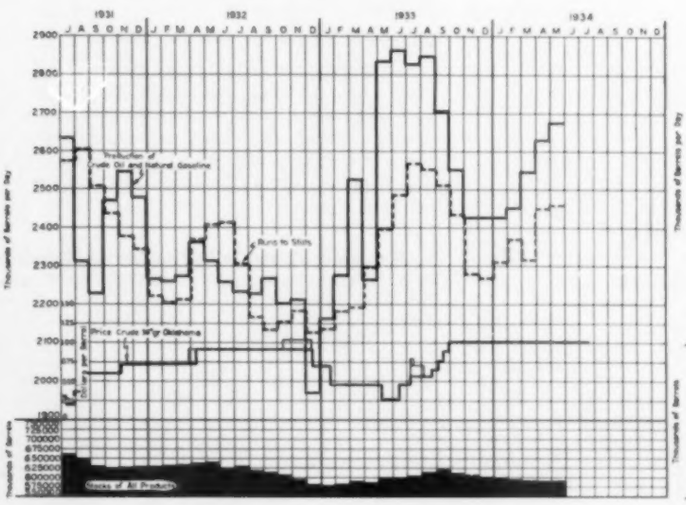
Federal Control Fails to Curb Output

THE FEDERAL government in Washington, D. C., continued to add new rules and regulations to control effectively the over-production of crude oil and gasoline, and at the same time was slowly putting into operation formerly adopted measures. Thus the tax of one-tenth of a cent on production and on processing of crude oil while effective June 9, was as yet not in operation on August 20 because of the inability to obtain the necessary forms. And on August 14 Secretary Ickes issued six new forms for reports from operators as provided under revised regulations promulgated July 20, the new forms being encyclopedic in character and covering every minute detail of producing, processing and transportation of crude oil and its products, more particularly in the East Texas field district.

There is no doubt that the federal government, and more particularly Secretary Ickes, have done great work in at least partially stabilizing the oil industry, but at the same time the fundamental problem of crude oil overproduction remained unsolved with current output being near the all-time record for the United States. Reviewing the federal measures of the past year one cannot but feel that the government made a flying start, only to be lost in the maze of details. Instead of concentrating on principal evil, crude oil overproduction in the East Texas field, and entrusting enforcement to a few competent individuals, the government went into control of all phases of business, superficially at first, but later necessarily getting into greater and greater details until now there are numberless officials, committees and sub-committees in each other's way, while around 100,000 bbl. of crude oil continues to be overproduced in the East Texas field, with other fields necessarily following this example in a minor way, but with an appreciable total. It appears that solution of the East Texas problem is in periodical complete shut-downs of the pool in direct ratio to the overproduction, shut-downs enforced by military or police force under national emergency legislation. Thus if the East Texas field overproduced around 100,000 bbl. per day for three months, under an allowance of 400,000 bbl. per day, for a total of 9,000,000 bbl. then the field should be completely shut down for 22½ days, and such shut-downs repeated at intervals to be decided upon. Such measure would hurt many operators now abiding by the laws, but many of them in the past not only tolerated illegal production but even purchased and/or, transported it, while if successful and if held constitutional it will solve the most pressing problem of the day in the oil industry with minimum effort on the part of federal authorities.

A United States Supreme Court test of the authority of the government to regulate the crude oil production under the NIRA was assured on August 15 when the Department of Justice informed the court it would interpose no objections to a review. The suit is being brought by the Amazon Petroleum Corporation, Panama Refining Company and others challenging the law establishing the NRA and especially the oil regulations under it, claiming that the NIRA made the President "a supreme dictator" by giving him legislative powers and that the government's claim of regulation of interstate commerce is in reality curtailment of production to advance the prices. The suit has been decided in favor of the Amazon Petroleum Corporation and others by a federal district court in Texas, which enjoined federal officials from enforcing petroleum code regulations, but that decision was

U. S. production, runs to stills and price of crude oil in relation to stocks of all petroleum products.


1931
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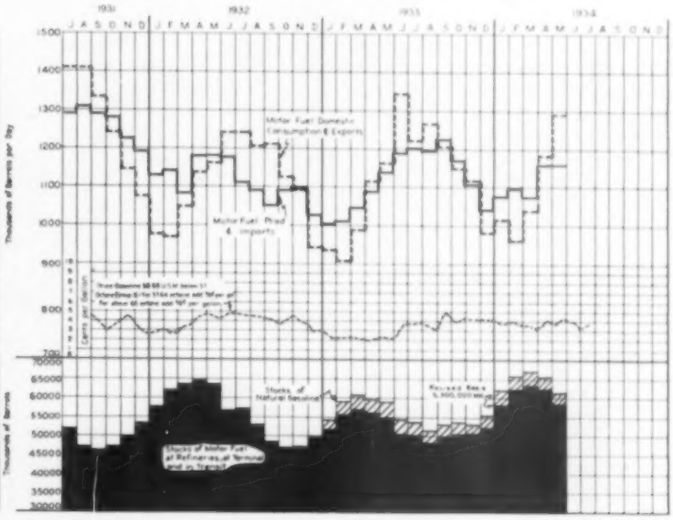
J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
Production of Crude Oil and Natural Gasoline
Runs to Stills
Price Crude W'ly Oklahoma
Stocks of All Products
Thousands of Barrels per Day

U. S. consumption and exports, production, imports and prices of motor fuel in relation to motor fuel stocks.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Motor Fuel Domestic Consumption & Exports
Motor Fuel Prod. & Imports
Stocks of Natural Gasoline
Thousands of Barrels per Day

reversed by the Fifth Circuit Court of Appeals. It is most probable that the U. S. Supreme Court will uphold the NIRA and the federal oil regulations as emergency measures.

An excellent illustration of the fallacy of the present federal policy is the much publicized Eason case in Oklahoma. Eason Oil Company operates a producing oil lease on the edge of Crescent field in Central Oklahoma where the Petroleum Administrator approved a plan of development of only one well to forty acres to be located in the center of each such parcel of land. Such spacing of wells is a debatable practice under most favorable and uniform structural and sand conditions, but when the structures are very sharp, as is the case in Crescent, a difference of but 100 ft. in locations may and does mean a difference between an oil well and a dry hole and Eason Oil Company was entirely justified in locating its wells on the edge leases nearer to the structural high. The more unfavorable aspect of the situation is that in Crescent field, which is of secondary importance and allowed but 5,000 bbl. per day, there never was any question about exceeding the assigned quotas, Eason Oil Company fully prorating its wells, while at the same time East Texas and some other more important fields are continuing to crowd in more and more wells and to overproduce crude oil without interference. Judge Edgar S. Vaught, in Federal District Court in Oklahoma City, on August 18 postponed his decision on the case pending further study, but probably will rule in favor of the Eason Oil Company and against the Federal Petroleum Board.

Texas Proration

THE TEXAS Railroad Commission issued orders, effective August 10, requiring legal tenders on shipment of refined products from the East Texas field. Gasoline and kerosene still may be shipped without certified tenders from the Commission, though it is planned to extend the order to include all petroleum products. The Commission reported that several topping plants have been subsequently closed, unable to dispose of their products.

However, on August 21 District Judge Harry Dolan temporarily restrained the Texas Railroad Commission from enforcing the tender shipment order, at the same time enjoining the International Great North railroad from refusing to accept for shipment oil offered without tenders. The suit was brought by eleven independent refiners in the East Texas field.

The East Texas field continued to overproduce between 60,000 and 100,000 bbl. per day, under a daily allowance of 400,000 bbl.

Labor Problem

ON AUGUST 17 Secretary of the Interior Harold L. Ickes approved the recommendation of the Petroleum Labor Policy Board that the Gulf Refining Company be prosecuted on charges of having violated the labor provisions of the Oil Code after the strike called by the employees of the company at its Girard Point (Philadelphia) plant late in June. The Board reported to the Secretary that the company had won the strike but in order to do so it had resorted to a violation of the Code, and that "copies of the Company's payrolls indicate that after resuming operations on July 17, the company worked a substantial number of its employees throughout the period to July 31 hours far in excess of the maximum established in the Code." The Board also advised Secretary Ickes that the company discharged all employees, including many with long years of service, who had gone on strike (in an effort to injure the interests of their employers) and who failed to accept the company's request to return to work, and replaced them with other employees. The Petroleum Labor Policy Board apparently is determined to see that in any dispute between employers and employees, the latter shall have every advantage within the power of the Administration to grant, while the employers shall be hampered as far as possible.

Imports Above Federal Quota

DURING June, 1934, total imports of all petroleum products into the United States increased slightly to 4,712,000 bbl., 157,100 bbl. per day, as compared with 4,456,000 bbl., 143,800 bbl. per day, imported during the preceding month. Under the federal quota the imports are limited to 108,400 bbl. per day; therefore during June, 1934, the quota was exceeded by 48,700 bbl. per day; and over the September, 1933–June, 1934 period, inclusive, the imports averaged 123,900 bbl. per day, therefore exceeding the quota by 15,500 bbl. per day and by 4,700,000 bbl. over the whole restricted period.

Exports of all petroleum products, including motor fuel, in June, 1934, remained unchanged from the preceding month, 9,851,000 bbl., 328,000 bbl. per day, having been exported during June, as compared with 9,639,000 bbl., 310,000 bbl. per day, shipped in May, 1934; and were only 4.01 percent above total exports in May of 1933. The exports of petroleum products from the United States currently approximate the exports in the corresponding months of 1933 because June of that year was the first month in which the U. S. dollar was quoted at a discount of about 30 percent of its original gold value. Motor fuel exports during June, 1934, amounted to 2,057,000 bbl. as compared with 1,907,000 bbl. exported in May, 1934, an increase of 7.86 percent; but were 21.48 percent below motor fuel exports in June of 1933. Exports of crude oil from the United States remained unchanged during June, 1934, 3,795,000 bbl. having been shipped, as compared with 3,724,000 bbl. exported in the preceding month, and 4,378,000 bbl. exported in June of 1933 at the height of East Texas overproduction with the attendant very cheap crude oil. Therefore in June, 1934, crude oil constituted 38.5 percent of the total exports of all petroleum products.

Large Overproduction Continues

CRUDE oil and natural gasoline production during July, 1934, averaged about 2,750,000 bbl. per day, 18,000 bbl. per day below the preceding month when the average production was 2,768,000 bbl. per day; and also was 67,000 bbl. below the crude oil and natural gasoline production in July of 1933, when the East Texas field was out of control for the third consecutive month producing around 1,000,000 bbl. per day. However, the estimated July, 1934, crude oil production of 2,650,000 bbl. continued to exceed the federal allowable by around 120,000 bbl. per day, and the approximately similar rate of overproduction was extended into the first half of August. For June and July, 1934, crude oil production in United States was less than 100,000 bbl. per day below the all-time record established in June of 1933 when it averaged 2,762,000 bbl. per day. East Texas continued as the principal source of overproduction, followed by Oklahoma, while California and Kansas produced almost within the federal allowable.

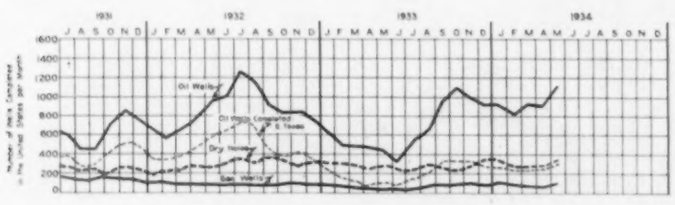
Total stocks of all oils increased by 2,085,000 bbl. during June, 1934, to a total of 589,808,000 bbl., indicating a daily gross increase of 69,500 bbl.

The crude oil runs to stills during July, 1934, averaged around 2,563,000 bbl. per day, or at a rate generally conceded to be about 100,000 bbl. per day in excess of the economic limit set with the view of sufficiently reducing the current unwieldy and price depressing stocks.

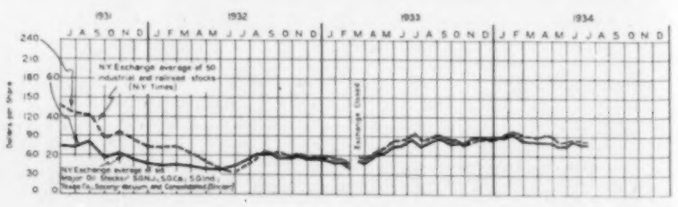
Motor Fuel Demand Steady

INDICATED domestic demand for motor fuel during June, 1934, averaged 1,210,000 bbl. per day, a decrease of 1.63 percent below the daily average during May, 1934, when 1,230,000 bbl. per day were consumed; 25,000 bbl. per day above the domestic motor fuel consump-

U. S. drilling; comparison of oil wells, dry holes, and gas wells.



Six major oil stocks in relation to 50 industrial stocks on the New York Stock Exchange.


1931
1932
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N.Y. Exchange average of 50 industrial and railroad stocks (N.Y. Times)
Exchange Closed

tion in June of 1933 (*), an increase of 2.11 percent; 42,000 bbl. per day above the domestic motor fuel consumption in June of 1932 (*), an increase of 3.60 percent; but as yet 95,000 bbl. per day below the domestic motor fuel consumption in June of 1931, the peak year, a decrease of 7.28 percent. The current domestic motor fuel consumption thus continued to exceed the domestic demand in the corresponding months of 1933, though falling short of the May, 1934, record, during which month domestic motor fuel consumption exceeded even the peak year May demand, possibly due to much more favorable weather conditions in May of 1934. The NEW YORK TIMES weekly combined business index remained virtually unchanged during the past month standing around 79.0; as compared with the average of 84.0 in the March–June, 1934, period; and as compared with 89.0 in August of 1933; 64.0 in August of 1932 and 83.0 in August of 1931. The labor situation continued seriously to depress the business activity in the United States, while the uncertainty attached to the NRA policies and the monetary problem also tended to delay the natural forces of recovery.

The daily rate of exports of motor fuel averaged 69,000 bbl. in June, 1934, 11.3 percent above the exports in the preceding month; 20.7 percent under the motor fuel exports in June of 1933; 41.2 percent under the exports in June of 1932; and 36.6 percent under the exports in June of 1931.

Total daily demand for motor fuel in June, 1934, therefore was 1,279,000 bbl., an increase of but 0.55 percent as compared with the total daily demand in June of 1933; 0.47 percent under total daily demand in May of 1932; and 9.54 percent under total demand in May of 1931, the year in which motor fuel demand was at its peak.

On July 1, 1934, motor fuel stocks at refineries, plants, terminals and in transit amounted to 58,791,000 bbl., a decrease of 2,837,000 bbl. as compared with stocks on hand on June 1, 1934, indicating that during June motor fuel demand exceeded supply by 94,400 bbl. per day.

Prices Weak

DURING late July and first half of August crude oil prices throughout the United States were maintained, but refinery gasoline quotations weakened appreciably in August, under the influence of continued "hot" oil production in the East Texas field. In retail marketing "price wars" were localized to a few large cities, most serious undercutting taking place in Boston, Mass., to 14 cents a gallon at service stations; in Providence, R. I., to 13.0 cents; in St. Joseph, Mo., to 12.4 cents; in Kansas City, Mo., to 15.0 cents; in Sioux City, Ia., to 12.9 cents; in Peoria, Ill., to 13.9 cents and in New Orleans, La., to 15.0 cents. Pacific Coast retail prices were maintained but recent large shipments of Texas motor fuel to Pacific ports caused some apprehension there for fear that the purchasers may attempt to undersell the California product. The situation was much more hopeful when on August 20 the oil tanker PAPOOSE with 3,000,000 gallons of gasoline was barred from discharging its cargo in San Francisco by federal and state officers under orders from Secretary Ickes who claimed that the gasoline was partly produced from "hot oil". From San Francisco the tanker sailed to Tacoma, Wash., but will be in all probability also barred from unloading its cargo there, or any other port along the United States' Pacific Coast, and will be forced to sail to Vancouver, B. C. where it would be out of American jurisdiction.

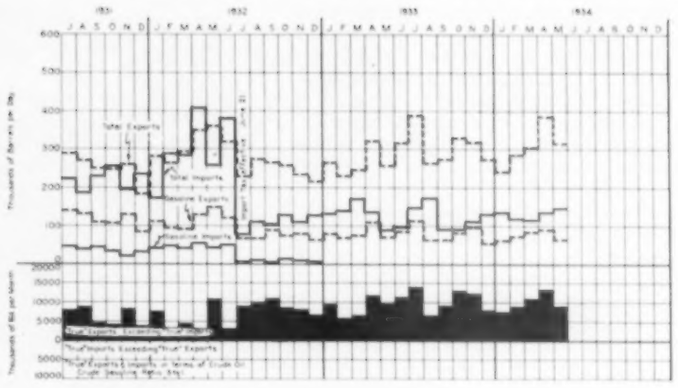
Tank wagon/service station motor fuel prices per gallon, regular grade and including all taxes, in representative districts in the middle of August were: 16.5/17.5 cents in metropolitan New York (18.3/17.8 cents in Newark, N. J.); 13.0/14.0 cents in Boston, Mass.; 11.0/13.0 cents in Providence, R. I.; 15.3/17.3 cents in Chicago; 17.5/19.5 cents in Ohio; 17.5/19.5 and 15.5/17.5 cents in San Francisco and Los Angeles respectively; 16.0/18.0 cents in Oklahoma; 15.0/17.0 cents in St. Louis; and 24.0/27.0 cents in Montreal, Canada, with a 2-cent differential for the premium grade.

Refinery gasoline quotation in the mid-Continent district weakened around ¼ of a cent from the preceding month due to only partial success of the East Texas "cartel" plan. The official Mid-Continent octane groupings in August were rearranged inasmuch as for some time gasoline with octane rating as high as 70 sold as the middle grade product, though actually the middle-grade gasoline was rated only up to 64.9 octane. Refinery gasoline was quoted on August 20 at 3⅞-4 cents per gallon for 58–60 U. S. M. grade 62.9 and below octane rating in Group 3, Oklahoma market, but on spot market sold for 3¼-3½ cents per gallon; 63.0 to 70.9 octane rating, U. S. M., brought 4½-4⅝ cents per gallon; and 71 and above octane rating. U. S. M., commanded 4⅞-5 cents per gallon; in East Texas district the third grade gasoline sold down to 3⅜-3¼ cents a gallon. On the East Coast, at Bayonne, U. S. M. grade 60.0 to 64.9 octane rating was quoted unchanged at 6¼-6½ cents per gallon (3.76 cents gold *). Gulf Coast prices for export on August 20 were weaker at 4-4⅛ cents per gallon (2.43 cents gold *) for 58–60 U. S. M. grade.

Natural gasoline quotations further recovered after their slump early in July, influenced in part by the approaching cold weather and consequent manufacture of lighter motor fuels, and on August 20 grade 26–70 was quoted at 3.0 cents a gallon (1.77 cents gold *) in Oklahoma and in North Texas, and at 3⅜ cents a gallon (1.99 cents gold *) in North Louisiana.

Kerosene prices remained steady and unchanged during the past month and on August 20 grade 41–43 w.w. was quoted at 3⅛-3¼ cents a gallon in Group 3, Oklahoma market; and at 5¼-5½ cents a gallon (3.17 cents gold *) on the East Coast at Bayonne. Gulf Coast prices for export also remained steady at 4-4⅛ cents a gallon (2.44 cents gold *) for 41–43 p.w. grade.

The prospects for the maintenance of the current prices for petroleum products are poor, in fact even the crude oil schedules may be carried down in the general price readjustments. Four major factors contribute to the present instability in the oil industry: (1) the production of "hot" oil in the East Texas field, now estimated at between 50,000 and 75,000 bbl. per day, with the resultant selling of cheap gasoline, which cannot be handled through regular marketing or "cartel" channels. At this writing there are some ten tankers loaded with undisposed gasoline along the Gulf Coast overhanging both Eastern and Pacific markets, while several hundred loaded tank cars are reported to be on the railroad tracks in the East Texas field; (2) the almost hopeless maze of various federal and state laws, rules and regulations which currently not only fail to relieve the situation, but complicate it through a multitude of bureaucratic committees and sub-committees; (3) indefiniteness of the future of the National Recovery Administration; and (4) labor difficulties. Some faint hope for improvement in the present impasse may be hinged: (1) upon satisfactory domestic consumption of motor fuel, soon due, however, for seasonal decline; (2) upon continuance into August of buying of distress gasoline in East Texas and in California by the major companies, and its probable extension else-



▲ *Total U. S. imports and exports and gasoline imports and exports in relation to true exports exceeding true imports.* ▼

*** In 1932 and 1933 the June and July figures are averaged because of large reserve accumulation of motor fuel by distributors in anticipation of the Federal one-cent and one-half cent excise taxes made effective at the close of June 1932 and June 1933 respectively.**

*** U. S. Dollar at 41 percent discount.**

where, which, however, may become too vast an enterprise if the independents merely avail themselves of an opportunity to dispose of more and more gasoline; (3) upon some new laws, rules and regulations, or more effective enforcement, all of which have failed up to date.

East Texas District

THE RECENTLY discovered Rusk field, in Cherokee County of East Texas, during the past month recorded a completion of a dry hole, T. J. Wood and R. M. Young No. 2 New Birmingham Development Company, located but 700 ft. due southwest from the discovery when it cored 5 ft. of salt water sand at 5,148–5,156 ft. and was abandoned with a total depth of 5,163 ft. In the meanwhile the discovery well, No. 1 N. B. D. Co., stopped flowing, after producing on the latest gage 240 bbl. of oil and 60 bbl. of salt water, and was to be agitated and possibly put on pump. Last month's developments in the Rusk area bring to an apparent close one of the wildest plays in Texas for several months, in which very high prices, up to $1,000 per acre, were paid for leases now condemned.

The Cayuga field in Anderson County was further defined during July–August period by four wells which tested only salt water in the productive section of the Woodbine formation, but were to be saved as small gas wells from an upper sand. Three of the dry holes are close to the productive area, while the fourth is about 2 miles due southwest. The recent failures limit the producing area of the Cayuga field to about 2,000 acres, and its total reserves to not over 20,000,000 bbl. to be recovered over an extended period of time, thus putting the new pool in a minor class.

The drilling in of new wells in the East Texas field continued at a rate of about 70 a week, while around 65 new locations were made each week. There were in the East Texas field 14,300 producing oil wells on September 1, or an average of 7.68 acres per well. Therefore the drilling investment alone in the field now stands at around $230,000,000 whereas one well to twenty acres would have been entirely sufficient, in which case there would have been only 5,500 wells drilled costing $88,000,000; thus the apparent economic waste in the field for drilling alone reached to date $142,000,000.

Oklahoma

THE FITTS field in southeastern Pontotoc County, about 28 miles due south from the Greater Seminole, which formerly produced some oil and gas from several shallow sands, early in August saw the completion of three large deep Simpson sand producers, possibly opening an oil field of great importance. Jack Shaffer et al No. 1-A Harden, the discovery well, in section 30-T2N-R7E was brought in for 4,500 bbl. per day initially from Simpson sands and dolomite of Ordovican age from 4,175 to 4,210 ft.; Crosbie and Moran No. 2 Harden also in section 30-T2N-R7E, half a mile due northeast from discovery, was completed for 2,820 bbl. per day initially in Simpson sand from 4,180 to 4,290 ft.; and E. H. Moore et al No. 2 Wirick in section 29-T2N-R7E, one mile due southeast from Crosbie and Moran well, was completed for 500 bbl. per day from the upper Simpson section with a total depth of 3,990 ft. The crude oil in Fitts field tests around 38 deg. Be gravity. Three dry holes in the Simpson formation have been completed about one mile due north from the new producers, limiting the field in that direction, but otherwise the Fitts pool is undefined with excellent opportunity of extending east and west. Fifteen locations have been staked since discovery of the prolific Simpson production, and if the field will prove to be large an active drilling campaign is anticipated. Moreover the Fitts pool may prove to be the first of a number of fields in this general area, associated with well known east west faults forming Franks Graben.

The new Fitts pool is remarkable for the reason that all the leases are owned by smaller independent operators, with the single exception of the Magnolia Petroleum Company (Socony-Vacuum) which controls considerable acreage near new producers and has started four wells. Of independent operators principal operators in the Fitts pool are:—Jack Shaffer, Inc.; J. E. Crosbie, Inc., Loual Drilling Company; W. A. Delaney and Moore Wirick, Inc. The operators of recent completions agreed on August 11 to curtail production of their Simpson sand wells to 125 bbl. per day, while an effort is being now made to delay the drilling campaign. The field is currently allowed 1,000 bbl. per day. Stanolind Pipe Line Company (S. O. Indiana) will purchase and run the production.

The Edmond field, in Oklahoma County, 12 miles due north from the Oklahoma City field, as predicted in the preceding issue of WORLD PETROLEUM, witnessed completion of two large wells. Amerada Petroleum Corporation and Stanolind Oil and Gas Company's No. 1 Suneram in section 6-T13N-R3W, diagonal southwest offset of the old discovery well of Mid-Kansas Oil and Gas Company completed for 825 bbl. of 38 gravity in September of 1930, was brought in for 9,500 bbl. of 37.5 gravity crude and 7,000,000 cu. ft. of gas per day initially from Simpson sand with a total depth of 6,668 ft., while Mid-Kansas Oil and Gas Company's No. 1 Dahl in section 31-T14N-R3W, the west offset of the discovery and the north offset of No. 1 Suneram, was being completed flowing 3,800 bbl. of crude oil and 30,000,000 cu. ft. of gas per day while drilling in with a total depth of 6,524 ft. Four new locations were made in the Edmond field south and west of new completions, and they will probably delimit the pool inasmuch as it is already defined by dry holes east and north. It is not likely that the field will exceed 1,500 acres in area, but very prolific production may be anticipated in parts of the Edmond pool.

In southwestern Oklahoma in the old shallow Chickasha gas field, opened 12 years ago, the first and very important deep test of John B. Nichols in section 26-T5N-R8W was deepened from its first oil sand at 2,960 to 3,000 ft. and cored a second oil saturated sand from 3,090 to 3,153 ft. and while cleaning out for completion was flowing 200 bbl. per day.

BASIL B. ZAVOICO

Memorial erected on the site of the original Drake well several years ago at Oil Creek, Pennsylvania, where toward the end of August this year the 75th anniversary of the petroleum industry was celebrated.

Effect of Federal Proration Orders in Principal Oil Producing States

(in barrels)

	Sept. 1933 to July 1934 Cumulative Overproduction	July 1934 Over-production	August 1934 Federal Daily Quota	Daily Average Production for week ending August 4	Daily Average Production for week ending August 11	September 1934 Federal Daily Quota
Texas	18,822,000	2,270,000	1,001,300	1,108,000	1,056,500	968,400
Oklahoma	5,561,000	590,000	480,100	415,000	535,000	461,000
California	4,810,000	320,000	489,200	500,000	513,000	457,000
Kansas	628,000	*	131,200	132,000	129,500	120,700
United States	31,277,000	3,360,000	2,449,300	2,512,000	2,587,500	2,341,700

* Kansas produced its allowable of 4,170,000 bbl. during July.

Progress Under Oil Code

(Continued from page 295)

In accord with the sincere cooperative effort by the majority of the industry, our policy in the administration of the Code has been to utilize all administrative methods to obtain compliance before beginning punitive action in the courts. This appears to be essentially in conformity with the spirit of the Code. However, there is a small group of recalcitrants in the petroleum industry as in all fields of human endeavor. This minority, for its own selfish and immediate gain, would sacrifice the welfare of the many. It will not abide by any rules of fair competition unless forced to do so by superior force. Legal methods that are available to us to punish these recalcitrants have been invoked in the past and will continue to be used until we are able to establish and maintain just standards of fair competition.

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Gulf Export Prices for Major Oil Products

Product		Cents per Gallon			
		July 16	July 25	August 5	August 15
Gasoline:	U. S. Motor	4⅛	4⅛	4⅛	4⅛
	64/66–375 E. P.	4⅛	4⅛	4⅛	4⅛
	59 Oct. & below	4¾	4¾	4¾	4¾
	65 Oct. & above	5¼	5¼	5¼	5¼
Aviation Gasoline:	73 Oct. & above	10½	10½	10½	10½
Kerosene:	44 w.w.	4¼	4¼	4¼	4¼
	41–43 w.w.	4⅛	4⅛	4⅛	4⅛
	41–43 p.w.	4	4	4	4
Gasoil:	26–30 transluse.	3⅛	3⅛	3⅛	3⅛
	30 plus transluse.	3⅛	3⅛	3⅛	3⅛
Fuel Oil:	Bunker purposes (per bbl.)	$1.15	$1.15	$1.15	$1.15
Grade C:	Cargo lots (per bbl.)	$0.90	$0.87½	$0.82.½	$0.80
	Diesel oil (per bbl.)	$1.80	$1.80	$1.80	$1.80
Lubricating Oil:	Bright Stock No. 8	33¼	33¼	27½	26
(New York Export	Bright Stock No. 6½	32½	32½	26½	25
Market)	Warren E	25½	25½	22¼	21
	600 Unfilt.	22	22	19½	18
	650 Unfilt.	25	25	22	19
	600 Flash s.r.	26	26	23	21
	630 Flash s.r.	31	31	27	25
	Neutral 200 No. 3	26	36	34½	34½
	Neutral 150 No. 3½	30	30	28	28
So. Texas:	300 B9. 3 pale	7	7	7	7
	500 3½ pale	7⅞	7⅞	7⅞	7⅞
	750 4 pale	8¾	8¾	8¾	8¾
	1200 4 pale	9¼	9¼	9¼	9¼
	500 No. 5–6 red	7⅝	7⅝	7⅝	7⅝
	750 5–6 red	9	9	9	9
	1200 5–6 red	9¼	9¼	9¼	9¼

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ROUMANIA

THE SITUATION of the Roumanian oil industry remains about in status quo. Production has shown a tendency to increase and prices continue to show a declining trend which on balance leaves the industry with a smaller income despite the greater output. The Roumanian Parliament met in special session to pass the budget, but this session did not bear the fruit hoped for by the oilmen. The burden of national and local taxation was not lifted, and nothing definite was done about constructing a pipeline from the oil region to Constantza, the principal oil port, which would enormously reduce the fob cost of Roumanian oil and put the industry in a far better position in relation to Iraq oil.

An Act of Parliament transferred control of the local pipelines from the oil wells to the refineries and rail points from an independent commission to the State Railway Administration. This will increase the revenues of the Railway Administration by Lei 200,000,000 per year. The oilmen, who as yet see slim chances for that pipeline to Constantza, have entertained hopes that with this access of easy money the Railway Administration would willingly reduce its rates on rail shipments of export oil to the ports. But to date nothing of the kind has happened nor is likely to happen, because the budget voted by Parliament is Lei 800,000,000 in excess of estimated revenues, and the government officials are under the necessity of holding on to all available cash.

The prolonged dispute between the government and the producers over the price to be paid for the government's share of the crude oil produced (oil royalties) has been settled by allowing the refineries to purchase this oil at the fob price quoted at the end of each month, Ploesti delivery. Thus ends the attempt of the government to extract more cash from the industry by peddling its royalty oil to foreigners, who would make no satisfactory offers. As the government gets an eighth (12 percent) of all crude oil brought to the surface, its revenue from this source (which is in addition to taxes) is considerable. For the fiscal year 1933–34 these royalties and accruals amounted to 1,658,509 tons.

Notwithstanding the heavy burden of taxes, high freights, and the stiff royalty of 12 percent, about which the oilmen complain unceasingly, and the continuing threat of Iraq oil, they are still eager to drill for oil. Offers of concessions in new perimeters usually bring out some keen competition. For instance, when concessions in perimeter XLVII in Valea Costei were put up the government received bids from responsible oil companies offering Lei 200,000 for each well drilled and a premium of 15 percent above the statutory royalty on production above the first 10,000 tons. This would seem to show that the oilmen still see large possibilities in Roumanian oil. This impression is strengthened by the fact that the "Credit Minier" has just laid the corner stone for a large new refinery at Brazi, which was made the occasion for an imposing celebration attended by numerous high financial and political personages.

One of the acts passed at the special session of Parliament was a "Law for the Protection of National Labor," which limits the number of foreigners who may be employed in Roumanian industries to 20 percent of the total.

Production

FIGURES for all districts from December 31 to June 1 show a total production of 3,350,283 tons from a total of 1,595 producing wells. During this period work was started on 65 new wells. Daily production increased from an average of 21,680 tons in January to 24,016 tons in May. The average daily

meterage of new drilling rose from 926 to 1,158 meters. Refining operations show a corresponding rise, the total quantity of crude treated passing from 623,345 tons in January to 716,630 tons in May. However, supplies going into domestic consumption fell from 130,077 to 96,786 tons, the difference helping to swell the volume of exports, which were 117,865 tons above the January figures. Stocks have shown no tendency to accumulate either in the field or at the refineries.

Although production has been on the upgrade, prices are on the downgrade. Taking January prices as 100, the May price index for the principal products shows light gasoline selling at 51 percent of the January figure, heavy gasoline at 73 percent, lamp oil at 55 percent, gas oil at 50 percent and fuel oil at 62 percent.

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MEXICO

THE Petroleum Department of the Ministry of National Economy strikes an optimistic note in predicting that the year's petroleum exports from Mexico will be 3,000,000 bbl. in excess of 1933 exports. This prediction is inspired by exportation of 12,708,649 bbl. in the first half of 1934. Further, the department foresees total production of crude in Mexico as much higher than in 1933, with actual production for the first half of 1934 at 18,829,000 bbl. During the first seven months of 1934 thirty-two productive wells with output aggregating 10,969 bbl. daily have been completed. Considerably more optimism in regard to the future of the Mexican petroleum industry seems to prevail in administration circles than was noticeable among Mexican citizens who were asked to subscribe to the stock of the proposed government controlled oil company.

Incorporation in the national petroleum reserves of the oil lands covered by several concessions recently cancelled, has increased the national reserves by more than 200,000 hectares. Should the administration continue its efforts to establish a government controlled oil company these cancelled concessions may prove a valuable asset to the government, a fact which stresses the uncertainty of oil operations in Mexico and does much to explain the tremendous decrease in Mexican production since 1921.

Import duties have been lifted on gasoline brought in for the exclusive use of individuals and private organizations in the northern district, Lower California Territory. This privilege applies to the entire district. Formerly, gasoline was exempt from import levies when brought into American border towns of the district.

Two small producing wells have been brought in in the Panuco zone, Vera Cruz.

Oil and by products exports in June included 1,270,379 bbl. of crude; 127,127 bbl. of gasoline and 21,751 metric tons (equivalent) of asphalt, reports national statistics department. June imports in this field were 9,705 metric tons of combustible; 4,646 tons of crude, and 1,020,844 liters of gasoline.

DOUGLAS GRAHAME

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U. S. S. R.

Official Figures for Soviet Oil Operations

1934	Crude Production (bbl.)	Daily Average (bbl.)	Run to Stills (bbl.)	Drilling (feet)
January	13,356,000	430,840	11,680,000	317,011
February	12,488,000	446,000	10,621,800	321,509
March	14,644,000	472,000	12,257,000	360,096
April	14,081,000	469,397	12,637,100	353,311
May	14,315,000	461,774	13,101,900	384,793
June	13,966,000	465,546	12,363,400	385,387
July	14,297,500	461,210	12,744,900	402,267
Total 7 mos. 1934	97,147,500	458,714	85,407,000	2,524,374
Total 7 mos. 1933	81,419,100	384,052	72,119,200	1,411,062
Total 1933	149,901,900	407,950	131,591,300	2,789,253
Quota 1933	170,800,000	467,670	135,000,000	3,315,000
Quota 1934	214,900,000	588,876	161,000,000	4,950,000
Probable Production 1934	175,000,000	470,000	152,000,000	4,000,000

Crude conversion: One ton = seven bbl.

THE total daily average crude production for all Soviet oil fields has been stabilized during the last month at about 460,000 bbl. or 80 to 82 percent of plan fulfillment for the entire industry.

Both major Soviet oil fields Baku and Grozni show arrears of the plan and while Baku produces about 350,000 to 365,000 bbl. of crude per day, Grozni produces only between 66,000 and 70,000 bbl. of crude per day. The arrears of both regions are growing and drilling continues to present the greatest difficulty in both groups of oil fields. Strict measures were recently outlined by the Commissar for Heavy Industries in order to improve the operations and thanks to these a noticeable improvement has taken place in the promptness with which supplies of material and equipment reach the fields. Domestic machine shops were ordered and apparently have recently been keeping well informed of the requirements of the oil industry. Despite the pledge of the Communist Party to lend a helping hand in order to enable plan fulfillment for the year, no material improvement has as yet taken place.

At individual wells of Baku and Grozni the usual drilling distance per table per month of 495 to 650 ft., which has become the traditional standard for all Soviet oil fields, has been exceeded from time to time by additional 500–600 and 800 ft. of drilling distance per rotary table per month and at the Malgobek field of Grozni 3,135 feet of drilling were attained during July. The drilling team has improved its efficiency and 70 percent of the time required for the operation has been utilized for drilling proper, which is the highest record for all time in Soviet Russia.

The time required for drilling operations is distributed as follows:

11 percent, lifting of equipment; 3 percent, lost time owing to lack of water; 8.5 percent, lost time resulting from lack of power; 4.8 percent, devoted to repairs; 2.7 percent, miscellaneous time losses; and 70 percent, devoted to drilling proper.

The total crude produced by all oil fields during seven months ending July though 20 percent short of the plan, represents at the same time an increase of about 12 percent over the corresponding figure for the same period of last year. Runs to stills were likewise increased against last year about 14 percent while the arrears of plan amount to about 12 percent. The drilling division has exceeded the figure of last year by about 1,000-000 ft.; but the arrears of the plan are equal to about 500,000 ft.

A definite reversal of the downward trend in crude production was expected during the second quarter when all Soviet oil fields were to produce a quantity of 50,797,000 bbl. of crude. The actual figure of production for

the period is 42,362,000 bbl. of crude oil.

No improvement has taken place in production of gasoline. The total for the first six months 1934 has fallen below the corresponding figure for the same period of last year as well as below plan. During the first 10 days of July about 69,500 tons of gasoline were produced against 92,000 tons as required by the quota. The oil industry is apparently lagging behind all other branches of Soviet heavy industries. Only drilling has shown an increase over last year. The increases during the first six months 1934 against 1933 are about 55 percent and 75 percent against 1932. Here again it would be well to point out that drilling distance is being acquired to some extent by sacrificing drilling quality.

While the tempo of operations has decreased markedly, cost of operations in the oil industry during the first six months 1934 has increased 5.5 percent against a decrease of 5.5 percent in all other heavy industries and against individual decreases of 9.8 percent in machine building and 3.3 percent in production of sulphuric acid.

Analysis of Various Soviet Crudes

Grade	Percent Sulphur	Percent Paraffin	Percent Tar	Percent SO_3	Gravity Fuel oil
Baku: Surakhani	0.04	2.4	5.8	0.02–0.06	.887
Balakhani	0.05	0.4–1.0	22–29	0.19–0.22	.930
Grozni: Paraffin base	0.20	4.5	20.0	0.228–0.044	.910
Perm	2.33	2.50	58.0		.959
Sterlitamak	2.68	1.38	30.0	0.006	.954
Chussovo	5.40	1.20	55.0		1.03
Sakhalin	1.12	2.08	47.0	0.005	.947

Equipment Requirements

BAKU OIL fields continue to supply over 70 percent of the total crude derived from all Soviet oil fields. Operations of late have improved considerably, but the present daily average of crude production of 350,000–365,000 bbl. is still about 50,000 bbl. below the quota set for all oil field groups of Baku for the period between May and the end of the year, by the Central Committee of the regional Azerbaidzan Communist Party. Mr. Yeffuni, assistant chairman of Glavneft, has recently visited Baku oil fields and has reported that retarded drilling is mainly responsible for failure to fulfil the quota. The Lokbatan field which has become famous for its several gushers and elsewhere in the Lenin, Stalin and Kiroff groups, storage of crude is so poorly provided for as to be responsible for large losses from storage.

Storage tanks and facilities for transportation are unprotected and exposed to the weather. Volatile ingredients evaporate and tank capacity is being overtaxed. Mr. Yeffuni quotes a story told by Mr. Machno, manager of the Lenin group of fields of the consternation caused in an oil field of the United States while Mr. Machno was visiting that country, when a single drop of oil fell on his hat. In the Lenin group of fields high boots are required to go about the wells and even then one may drown in the huge lakes of oil formed around the wells. Not only are light products evaporating but the fire hazard is considerable. Mr. M. Barinoff, head of Glavneft who recently made a visit to Baku complained of the shortage of equipment.

An acute shortage of four speed heavy duty drilling hoists is noticeable at Baku. Hoists manufactured in Russia resemble the type imported from the United States but they are bulky and inefficient and the operating capacity is below specifications. More than 500 of these units are required immediately and over 2,000 units will be required in 1937. The combined resources of domestic machine shops will suffice to build only 140 units. Rotary tables designed by Soviet machine shops are of inferior quality and are not yet fit for heavy duty. "D" type drilling pipe for admissible 85 kg. load per square millimeter is not available. Hence "C" type pipe for 60 kg. admissible loads per square millimeter is used and the possible results are evident. Mr. Barinoff further states that lack of adequate drilling bits and reliance upon "fish tail" tackle, while more modern drilling bits were introduced long ago elsewhere, is retarding the progress of drilling at Baku and at other Soviet oil fields.

A special commission consisting of M. Rukhimovitch, vice commissar for Heavy Industries, M. Barinoff, head of Glavneft and M. Poliakoff with several engineers and geologists has come to Baku to study prevailing conditions and to outline steps to be taken in order to catch up with the plans for crude production and the steps necessary to modernize the refineries.

A conference of oil men and representatives of the domestic machine industries was called at Baku during July and it is expected that this conference will establish closer relations between the machine shops and the Soviet petroleum industry.

Pumping wells at Baku produced during the second quarter of 1934 a total of 25,004,000 bbl. of crude of which 18,703,000 bbl. were obtained by compressors and 6,251,000 bbl. by deep pumps. This is an increase of 22 percent over the corresponding figure for the first quarter. Gusher production at Baku has fallen below expectation and has yielded only 53 percent of the quota for the half year.

Mr. I. Gubkin has discussed at length the reserve of oil lands at Baku and has obtained the figures shown in the accompanying table.

Potential production of the various fields is not, of course, uniform. Surakhani and Kala of the Ordzonikidze group and Kara Chukhur of the Kaganovitch fields as well as Lokbatan are all fields of possible flush production, while the Lenin group, Bingadi and others will yield only stripper wells. It is also expected that some 5,500 more hectares of oil lands will be prepared in 1934 making the reserves on January 1, 1935 about 8,800 hectares.

Baku Reserve Oil Lands

Oil Fields	Oil Lands Reserve January 1st 1933		Operated during 1934		Balance of Reserves January 1st 1935	
	Area (Hectares)	Wells	Area	Wells	Area	Wells
Lenin group	263	252	62	56	201	196
Surakhani	74	37	—	—	74	37
Ordzonikidze, Asisbekoff and Lokbatan	1,023	802	44	29	979	773
Buktha & Bibi Eibat	325	226	132	112	193	114
Kaganovitch (Kala)	498	445	140	103	358	342
Kiroff (Bingadi)	472	378	35	27	437	351
Bingadi (Sulu Tepe)	54	43	22	18	32	25
Mikoyan (Lokbatan)	211	172	56	46	155	126
Molotoff (Puta)	170	144	45	36	125	108
Puta (Ker Ges)	173	137	1	1	172	136
Island Artema	848	863	72	68	806	795
Total	4,441	3,499	609	496	3,532	3,003

Grozni

THE EXPECTED improvement at Grozni has so far failed to materialize and crude production remains below quota. The daily average of production for all old and new regions has become temporarily stabilized at between 60,000 and 70,000 bbl. of crude per day. The Molgabek development is proceeding slowly and has not yet brought any material return owing to difficulties of operation and lack of adequate equipment for deep drilling. The oil horizons of Molgabek are reported to be in the so-called "Podnadvig" structure which is 7,000 to 8,000 ft. deep. However, the first well No. 24/40 came in for 3,500 bbl. of light oil from a depth of about 4,000 ft. During 1928 two or three wells were sunk at Molgabek in an attempt to outline the "Podnadvig" structure, but the wells were not completed. Six more wells were sunk during 1931 on the eastern and western limits of the field and considerable data relating to the structure have been accumulated. Several of these wells came in yielding water-free paraffine base oil at the rate of between 300 and 400 bbl. per day. During the first half of 1934 a total of 24 wells are being drilled to depths between 1,500 and 3,500 ft. Eight more wells are to be drilled before the end of 1934.

New Grozni has produced a total of 280,000,000 bbl. of crude during the past 20 years since the discovery of the field and about 80 percent of all wells drilled were gushers flowing about

14,000 bbl. of crude per day for a number of years. The producing sand at about 3,000 ft. has evidently yielded all the oil available and in order to maintain production in these fields it has become necessary to drill into lower structures principally the "Maikop" sand which is below 7,000 ft. Geological surveys and exploration carried on in the past indicate that the structure at this depth is sharply faulted and broken. Professor I. Gubkin, together with other Soviet geologists, has collected some data on the New Grozni formations from which they conclude that the southern part of the formation has moved over the northern fold and has overlapped the lower productive structure. Early in June when well No. 69/13 came in for 5,000 bbl. of high grade light crude further exploration of the eastern part of the region was ordered.

Prof. Gubkin states that production at Grozneft has been limited by inadequate drilling and exploration in the past, resulting in but few new developments to replace exhausted wells.

During the past year the management of Grozni has successfully corrected many of the old mistakes but much remains to be done before the desired results in regard to rate of production are established. The statistical showing of Grozni during the past year was below expectations and plan fulfillment was less than 67 percent. Drilling for the past six months of 1934 has amounted to almost 500,000 ft., which is 2½ times the figure for the corresponding period of last year, but still insufficient to bring the expected results. All recent new discoveries have so far come in from the upper Maikop and Podnadvig sands between 3,000 and 3,250 ft. and in order to reach productive sands Grozni must overcome the shortage of materials and experience necessary for deep drilling. Mr. Ordzonikidze, Commissar for Heavy Industries while in Grozni expressed the desire to be shown a rotary table of domestic design and construction under operation. This, however, could not be done owing to the fact that all the domestic drilling outfits were awaiting repairs.

Generally speaking Grozni has not been as yet fully explored, and geological mapping of the fields is far behind the point achieved at Baku. Mr. Gubkin has cited the new discoveries at Grozni such as well No. 69/13 (5,000 bbl. per day) and the Molgabek well No. 13 which has yielded 5,000,000 bbl. of crude and still continues to flow at the rate of 1,500 bbl. per day as sufficient proof against the theory of exhaustion of the Grozni region, to which theory many of the Soviet oilmen still adhere. Mr. Gubkin believes that Molgabek field could also be extended eastward and northward.

K. Riabovol, head of Grozni, and other officials of the fields, state that only about 30 percent of the total drilling time is actually spent for drilling.

Maikop

The Maikop field ranks third among Soviet oil fields after Baku and Grozni. The crude grade is of high quality light oil produced under high gas pressure. Crude production at Maikop jumped from 2,912,000 bbl. in 1930 to 6,475,000 bbl. in 1932 and dropped to 4,221,000 bbl. in 1933. The quota for 1934 is 6,380,000 bbl. of crude and an equivalent of 190,000 tons of gas or a total of over 7,000,000 bbl. of crude. During the first half year 1934 Maikop has produced 2,955,000 bbl. of crude (100.3 percent of plan) against 1,955,000 bbl. produced during the first six months of 1933. There is still, however, ample room for improvement. Of the 72 wells under production in this field 39 wells or 54 percent are continuously idle owing to lack of compressors. The Apsheron Khadizensk region of the Maikop fields ranks among the major oil field groups of Soviet Russia and is equal in area to the Baku regions of Surakhani, Bibi Eibat and Buktha put together. While operating the wells Nos. 25–30 and 32 from the "C" sands it appeared that these deposits were exhausted, but by establishing new locations wells No. 172 and 195 were brought in for 6,000–7,000 bbl. of crude per day, initial production extending the limits of the field to a total area of 10–12 kilometers. Several more wells at depths of 3,500–4,000 ft. are producing from

(Continued on page 322)

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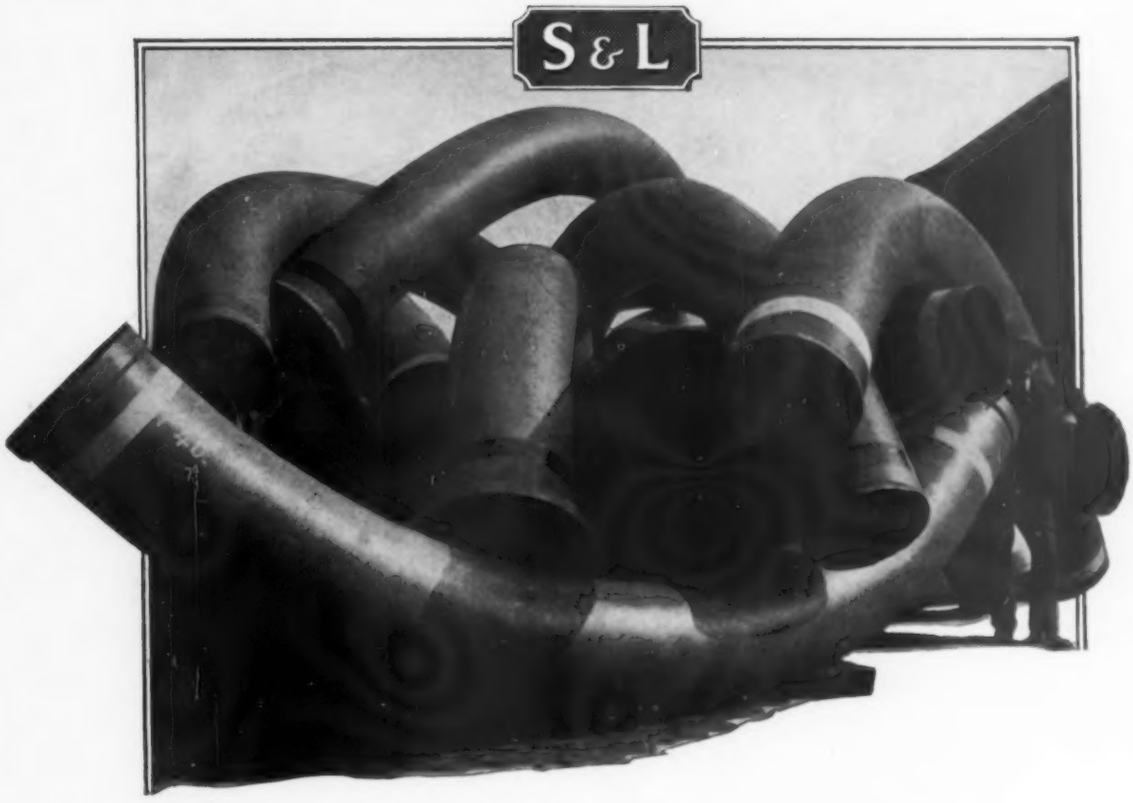

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Russia

(Continued from page 320)

highly saturated sands which resemble the "Shervansk formation".

Some three years ago Acad. I. Gubkin estimated Maikop reserves at 25,000,000 tons of crude, a figure which was ridiculed by other geologists. Now M. Maximoff, geologist of Maikop has confirmed the Maikop deposits as totalling about 28,000,000 tons of crude. However, until further extension of the fields to the Asphalt hills in the direction of Kutais it is likely that Maikop will be able to yield only about 5,000,000 tons of crude.

Crude production at Maikop in June and July decreased sharply owing to a serious breakdown in well No. 195 which has been producing almost 30 percent of the total crude of Maikop. Flowing production constitutes 57 percent of the total outturn as against 25.5 percent at Baku and 14 percent at Grozni.

The recently appointed head of Maikop is reported to have improved pumped production, which has jumped to 43 percent of the total as against 21 percent in 1933. Compressors and deep pumps are a recent introduction to Maikop, but those available are not yet sufficient to handle the full production. A new method of gas lift has been introduced at Maikop, in a form evolved by the Petroleum Scientific Institue "GINI", which is reported to obtain 30–40 percent additional production from exhausted wells, which were to be abandoned.

Other Discoveries

DURING 1933 Mangishlak, which is situated northeast of the Caspian sea was discovered. The area is a vast steppe, devoid of water and sparsely populated by semi-nomadic tribes. The central part of the region forms a peninsula which consists of the Coratan hills. The first attempts to explore this section were made in 1932 and during 1933 a geological expedition visited Karasias, Tapas and Tubedjik, which form an area of about 400 square kilometers of mesozoic formations of an anticlinal fold nature scattered and split up at several places. The decline of the fold does not exceed 12 degrees and the oil bearing formation consists of sands and sandstone which appear frequently on the surface. Two wells are at present drilling at about 4,000 feet. The area is believed to be an extension of Emba, but lacks the salt dome characteristics of Emba. This field if further developed will be used as an oil center for Karabugas Chemical Developments and will possibly be further extended to the valley between the Aral sea and Ust Urt where hydrocarbon gasses and some oil were discovered recently.

Sakhalin Crude for Khabarovsk

TWO TANKERS, LAND OF SOVIETS and FAR EAST, were completed at Blagovestchensk Shipyard for service between Moskalvo, oil terminal of Sakhalin, over the Tartar bay and channel to the port of Nikolayevsk, where the crude will be reloaded into river barges for transportation over the Amur river to Khabarovsk. Some 35,000 tons of crude will be carried to Khabarovsk up to end of 1934. The first barge BELORUSSIA carrying crude from Nikolayevsk to Khabarovsk arrived at the end of July and regular service has been initiated. The Khabarovsk refinery and cracking installation for 1,500,000 bbl. of crude capacity per annum is nearing completion. One cracking unit has already been put on stream.

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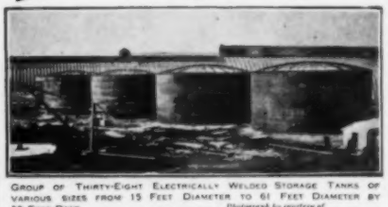

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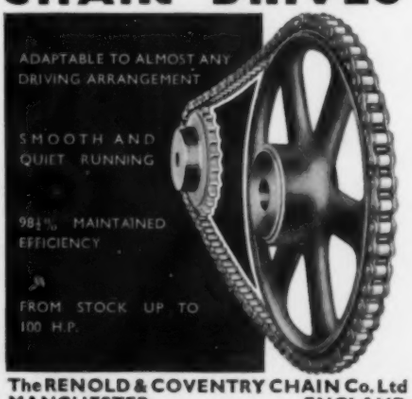
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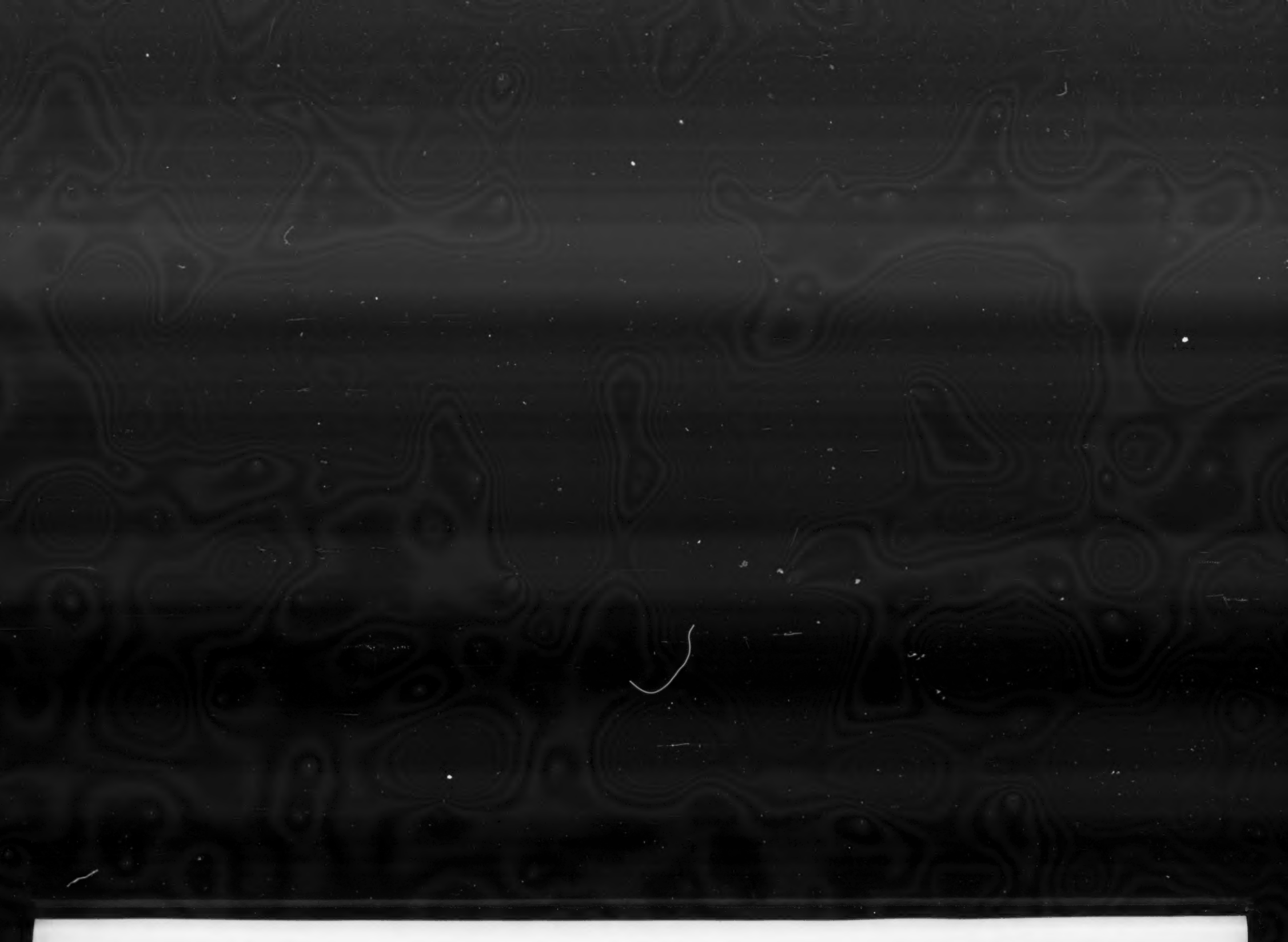
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